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Elastic Axle Boxes of Locomotives.

At a late meeting of the Institution of Mechanical Engineers (England), W. A. Fairbairn, of Manchester, read a paper on the construction of elastic axle boxes, for locomotives. They have been applied to several engines which have run 17,000 miles and have given great satisfaction, in the saving of wear and tear of the machinery.

An elastic cushion or spring of vulcanized india-rubber is placed between each axle box and the framing of the engine; this allows the wheels to accomodate themselves to curves on the track, and thus the wear on the flanges of the wheels and the faces of the axle boxes is diminished. The india-rubber spring is placed in a recess formed in the jaws of the horn plates upon each side of the box, and a metal plate with a smooth case-hardened surface is interposed upon which the axle box slides vertically with the inequalities of the road. The spring is of sufficient strength to keep the axle boxes fixed in place on a smooth direct road, but yield to the extra pressure at the curves, thereby permitting the axles to assume such a position as will place the wheels at a tangent to the curve. Care is exercised to fit these springs in their places in such a manner that none of the oil or grease used for lubrication will reach them One locomotive was fitted up with defective boxes, into which oil from the axle box penetrated, and destroyed the elasticity of the india-rubber.

These springs are employed in the form of layers or washers, each about one-thirteenth of an inch thick.

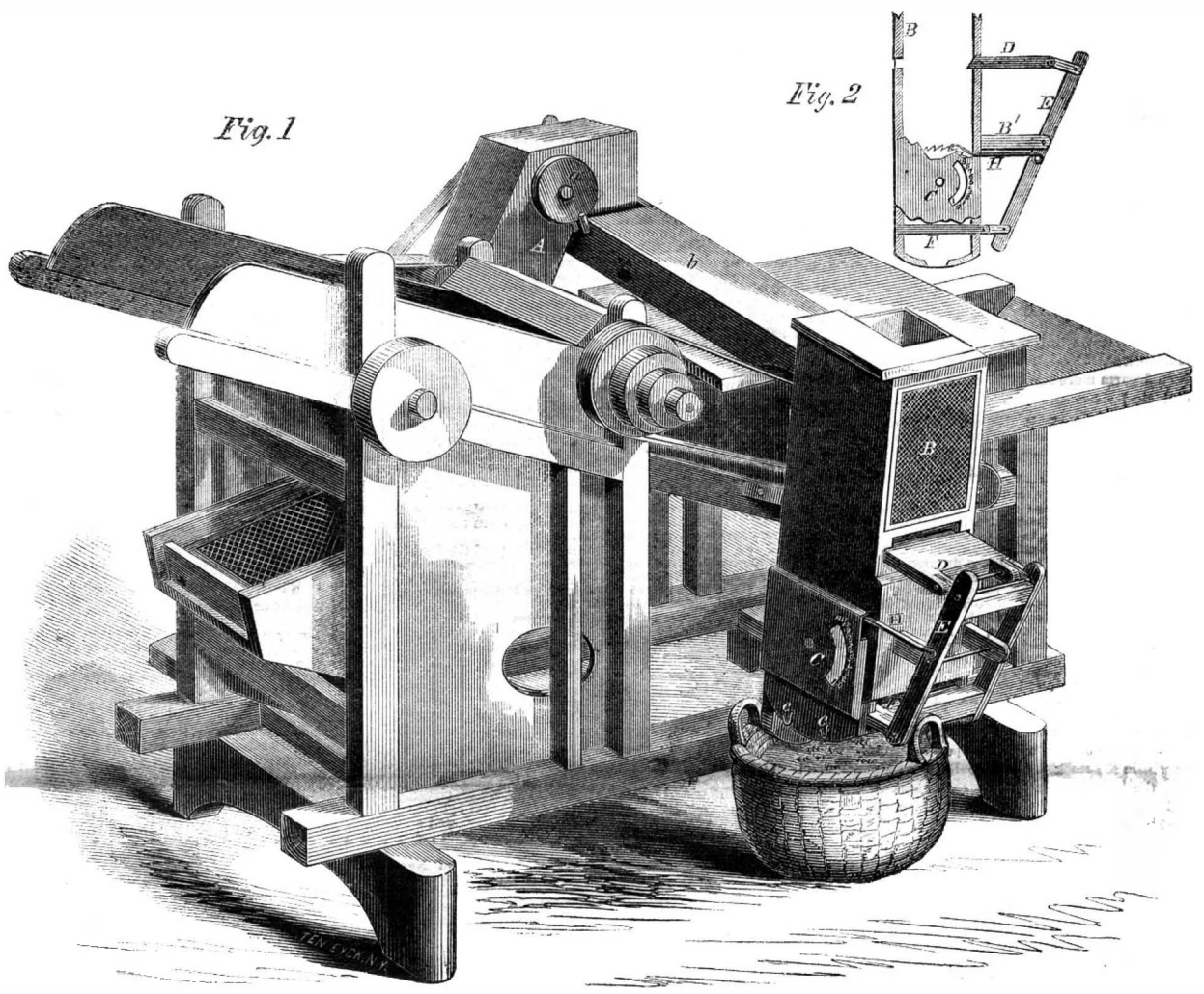
A similar application of such springs has also been made to the outside coupling rods of locomotives, by which the use of coters for tightning the brasses have been dispensed with, by employing a set screw at the end of the rod—this screw being secured by a locking nut to prevent it from working loose.

American Manufactures.

The *Boston Journal* states that the New England Society for the Promotion of Manufactures and the Mechanic Arts have decided to hold an auction sale in July, to comprise cotton and woolen goods, boots and shoes, and glass-ware of American manufacture. A committee of active business men, and of those having a large interest in these manufactures, will address letters to all those engaged in them, inviting their co-operation, and offering to take charge of the sales, which will be free to the contributors of goods.

IMPROVEMENT OF LONDON.—A French architect, M. Horeau, is in London with some most magnificent designs for the improvement of that city. He proposes to pull down here, cut through there, and commit beneficent ravages generally, but no one seems to encourage him; the *Builder* simply remarking, "M. Horeau is a poet!"

BARKER'S MACHINE FOR MEASURING AND BAGGING GRAIN.



It is a pleasant sight to see in the genial warmth of an autumnal day, or in the colder winter, the gatherers of the golden harvest threshing, winnowing, measuring, and bagging the grain, to be sent to distant lands or kept at home to feed our own people during the next twelve months. These occupations remind one of the past, and are suggestive of patriarchal days and pastoral times. But how much more interesting is it when we see a simple moving belt turning a machine which does all these operations consecutively and continuously, because it speaks to us of progress and amelioration, of human labor lightened and of work performed. True, much of the poetry is lost—that of association; but as much more is gained—that of imagination, for it gives us new ideas of the future, and makes us hope for a time when men will have more time to think of one another and less to think of themselves.

"But what has this to do with the invention of Peleg Barker, of North Adams, Mich., the description of which is the business in hand?" A vast amount, for he is the inventor of just such a machine, and it forms the subject of our present engraving.

The threshing-machine may be of any of the ordinary patterns now in use, and to its side the inventor attaches an elevator, A, in the bottom of which the grain is received, and it is carried to the top by buckets or scoops, when there it is discharged into the spout, *b*, that is suspended from the elevator and that is kept in motion to shake the grain along it by the cam wheel, *a*, working between two pins. The cam, *a*, is placed upon the shaft of the upper elevator roller, pulley, or axle. The grain from *b* falls into the measuring and registering device, B. The measurer is formed of two slides, the top one, D, forming a cut-off, and the bottom one, F, serves to prevent the grain falling out until the upper portion is cut off by D; the space between these two holding just a bushel or any other known and desired quantity. D and F are both attached to the frame, E, that moves on centers, B, and it has also an arm, H, attached to it, that, as E is moved on its center, moves back and forth, and operates a registering wheel, C, by means of ratchet teeth on its periphery. This is better seen in the section, Fig. 2. The wheel can be marked in tens, and the side of the box in units, so that a large number of bushels or other measures may be registered without having to record on paper. The bags can be attached to the small hooks, *c*, and then all that is required of the operator is to put the elevators in motion by a belt and to move the frame back and forth by hand, and the bags can be filled and the quantity of grain measured and registered very quickly.

This excellent invention was patented June 1, 1858, and the inventor will furnish any further particulars upon being addressed as above.

Insecurity of Heating Apparatus.

The Board of Fire Insurance Companies, in this city, recently appointed a commission to examine into the general security of stores, dwelling-houses, and churches as regards their heating apparatuses. The result of their investigations is interesting and at the same time startling. Two hundred and seventy-nine churches have been examined in this city, and of these 110 were found to be unsafe. In 98, the defects were remedied under the supervision of the commission. In Brooklyn, 97 churches were examined, 83 were found unsafe, and 38 of these are corrected. If so large a proportion of churches are unsafe, how is it likely to be with dwelling-houses? This is a subject which deserves serious consideration because there is no difficulty about ensuring the safety of such apparatus, and when this can be done, it is exceedingly unwise to run the risk of danger.

Substitute for Red Lead—Ocher.

An ocher found at Fontenville, France, has been patented by M. M. Bauchard and Clavel, of Paris, as a substitute for red lead in painting, and also as a cement for some purposes. Its composition is, silica, 50·00 parts; oxyd of iron, 14·50; alumina, 26·60; carbonate of lime, 7·60; sulphate and phosphate of lime, 1·20 parts. It is ground fine and mixed with oil in the usual manner for painting, and is called "Burgundy red." It is stated to make a good cement for steam boilers by mixing it as follows:—Ocher, 66 parts; oil, 15; lime, 11; chalk, 8. These substances are kneaded together until they have attained to the proper consistency, laid into the seams of iron, and allowed to dry before the boiler is used. Any of our readers can procure these materials, and make experiments as to the merits of this composition.

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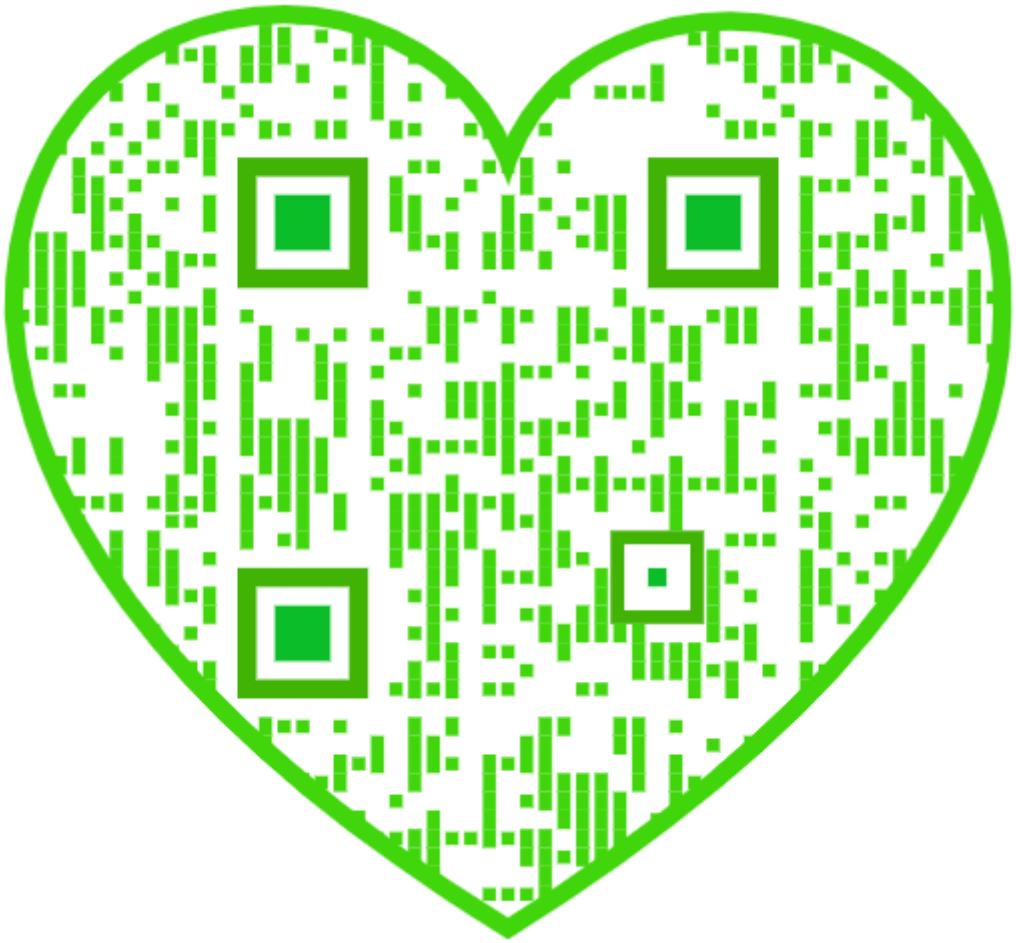

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 15, 1859.

[*Reported officially for the Scientific American.*]

*** Circulars giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

ADJUSTABLE WORMER FOR RAMRODS—Geo. E. Baldwin, of West Meriden, Conn. : I claim as a new article of manufacture, a wormer, that can be run out of, or into, a ferule on the end of a ramrod, so that the ramrod can be practically shortened or lengthened at pleasure, as represented.

BREECH-LOADING FIREARMS—Joseph Barber and P. C. Reinfried, of Bridesburg, Pa. : We claim the arrangement and combination of the spring trigger guard, E, pin, g, toggles, k k, sliding belt, j, and catch, substantially as and for the purpose shown and described.

[This invention relates to firearms which have a chambered breech hinged to the stock. It consists of a sliding bolt connected with a toggle below the stock, and with an elastic spring trigger-guard acting in combination with a beveled catch in the breech to lock the latter in line with the barrel for discharging, and also to unlock it for loading. A spring is also arranged below the breech to raise it to position for loading when it is unlocked. The improvement renders the movable breech firearm more safe and convenient for loading and firing.]

CHAIR BOTTOMS—Z. B. Bellows, of Cortlandtville, N. Y. : I claim the application to chairs of a bent, stamped or pressed board for a seat.

MAGAZINE FIREARMS—Paul Boynton, of Canton, N. Y. : I do not claim, broadly, the arrangement of a powder magazine in the breech of a gun, or of a ball-magazine, under and parallel with the barrel, nor yet the use of the slide, H, to load the bullets.

But I claim, first, Combining the powder magazine in the stock with the barrel of a firearm, by means of the faucet-like chambered breech, applied and operating as described to measure its own charge.

Second, Combining the bullet-loading slide, H, with the faucet-like chambered breech, by means of the ears on the slide, and the horns, m n, attached to the breech, that the side may be operated in combination with the breech in the manner specified.

Third, The combination with the faucet-like breech of the priming box, J, and its perforated collar, q, operated by a connection with the hammer, substantially as described.

[This invention consists in providing for the loading at the movable breech, with loose powder from a magazine within the stock, and with balls from a magazine under the barrel, whereby the operations of loading and firing are executed with great rapidity. By the act of cocking the hammer, a contrivance combined with the breech furnishes the priming for every charge. It is a regular destructive compact battery.]

MACHINE FOR BENDING WOOD FOR FELLOES—Geo. A. Brown, of Newfane, N. Y. : I claim the arrangement of the platform, E, screws d and i, and spring, c, with the mold-block, the several parts being constructed and operating substantially in the manner and for the purpose specified.

MACHINE FOR GRINDING AND POLISHING SAWS—Saml. S. Campbell, of Montreal, Canada : I claim, first, The specified arrangement of the longitudinal carriage-ways, D, on supports, E G, so that they, with the carriage, D', and all attachments may be inclined laterally, and caused to stand obliquely to the horizon, or the circumference of the lap or grinding-stone, for the purposes set forth.

Second, Arranging one of the supports of the machine on a pivot, e, and the other on a truck, H, which reciprocates on a circular railway, so that the carriage-ways and carriage, with all attachments thereof, may be adjusted in the path of a circle, so as to stand oblique to the shaft of the lap, or grindstone, substantially as and for the purposes set forth.

Third, Providing the longitudinal reciprocating carriage with a stationary stop, R, and a capping or holding-down plate, L, which is adjustable up and down, but stationary longitudinally, substantially as and for the purposes set forth.

APPARATUS FOR REGULATING THE SUPPLY OF WATER TO STEAM BOILERS—J. M. Colman, of Vincennes, Ind. : I do not claim the float in boiler or the cranks, levers, water-chest, valve, or detector.

But I claim the combined arrangement of these to effect the object desired, to regulate the water in a steam boiler to any desired point from which it cannot materially change.

PACKING CARTRIDGES—Samuel Colt, of Hartford, Conn. : I do not wish to limit my invention to the use of the string, though I have shown it, and found it to work well in practice, for a wire or other equivalent might be made to answer the purpose; neither do I confine myself to the exact arrangement shown of the string, or its equivalent, in the package.

But I claim the application of a string, wire, or other equivalent, to a cartridge package, or box, by which the package or box may be opened.

GRINDING APPLES—A. Dean, of Jerusalem, N. Y. : I claim, first, The crushing lever, H, and horizontal wheel, I, constructed as described and for the purpose set forth.

Second, I claim the eccentric wheel, B, and carriage, D, in combination with the cutter, H, and wheel, J, when constructed and operated in the manner and for the purposes before described.

PREVENTING COLLISIONS ON RAILROADS—Abram Dehuff, of York, Pa. : I am aware that the shoe or boot running under the wheel is not new; it has been made by others, and I do not claim it.

But I claim the spring carrier, A, hung on two inclined staples, B B, beneath the car or truck, to hug or embrace the wheels, cross-bar, C, long bar, E, lever, F, rod, G, lever, H, rod, I, levers, J J, and levers, K, when arranged for joint operation with each other, substantially as and for the purpose described.

MACHINE FOR FOLDING WOOL—R. D. M. Edwards, of Franklin, Mich. : I do not claim to be the original inventor of machines for folding wool.

But I claim the above described machine for folding wool, consisting of the table rim, D, the folding lids, Q R S T, operated by catches, levers and springs, riser, H, and platform, Z, the whole arranged, constructed, and operating substantially as and for the purposes set forth.

HANGING WELL BUCKETS.—S. F. Dexter, of Paris, N. Y. : I claim, first, The iron strap, C, with the levers D, and notch, E, to receive the spring stretcher, E', in combination with the chain, B, Fig. 1, and the manner of detaching the same by coming in contact with the rod, J.

Second, I claim the springs, G G, Fig. 3, and G, Fig. 4, when operated as described, or in any equivalent manner.

Third, I claim hanging the buckets at or below the bottom, as described, in combination with the spring or springs and levers, as above described, or in any equivalent manner.

CORN PLANTERS—Stephen Elliott, of Washington, Ind. : I claim the arrangement of the wheel, F, and pins L and K, the spiral springs, C C, the boxes, A A, blocks, B B, the rod, E, indicator, G, and leveling plow K, the whole being arranged, constructed and operated as above described and for the purpose set forth.

OBTAINING CURVED PRINTING SURFACES—Wm. H. Elliot, of Plattsburg, N. Y. : I do not claim casting stereotypes, by immersion, in molds formed upon and adhering to metallic plates. Nor do I claim a compound flexible matrix for casting curved stereotypes, as that is the subject of an English patent granted to Brunel in 1820.

But I claim, first, The combination of screws, k, with the concave cylindrical form, a, when these devices are used for bringing the compound flexible matrix, or impression sheet, to the required shape, or for holding it there, while metal is being deposited, or cast upon it, for the purpose of constructing electrotypes, or stereotypes, as specified.

Second, The employment of bars, d, in combination with the flexible sheet, c, for holding the matrix in a cylindrical form, when said bars are so applied to the ends of said sheet, that they shall prevent its being displaced, or springing up from the concave face of the outer shell, a, as set forth, whether said bars are attached to or rest against the edge of said sheet.

Third, The grooves, m m, in the inner shell, b, for casting upon the back of cylindrical type plates, lugs, or flanges, by which said plates may be fastened upon a cylinder, as and for the purpose set forth.

SUGAR MILLS—Ralph Emerson, Jr., of Rockford, Ill : I claim the combination of parts in the machine, in such manner as to subject the cane first to a lighter pressure, and afterwards to a heavier pressure, and to deliver the respective juices expressed by said lighter and heavier pressures into separate receptacles for the purpose specified.

I also claim the combination of the gage fillets with the pressure rolls, whereby any unskilled operator is enabled to adjust and work the machine, substantially as set forth.

PROCESS FOR EXTRACTING AND ASSORTING VEGETABLE JUICES BY PRESSURE—Ralph Emerson, Jr., of Rockford, Ill. : As I have procured a separate patent for the said mill, I refer to that patent for a more full description of it. In this patent I do not mean to limit myself to any special means for the extraction and separation of the pith and rind juices.

But I claim, first, The process of expressing and collecting the juice of the pith separately from that of the rind, for the purpose set forth.

I also claim, as one of the methods (and the best to me known), whereby the process of extracting the juices separately may be beneficially carried into effect, the subjection of the cane to a light pressure, to express the juice of the pith previously to the employment of a heavier pressure, to express the juice of the rind, whether the said pressures be successively performed in the same, or in different machines.

WATCH CHAINS, &C.—Henry Epstein, of New York City : I claim constructing a watch chain, which may be made stiff or inflexible at pleasure, by the turning of part of the tubular casing, to which an interior chain is attached, substantially in the manner and for the purpose described.

OPERATING FEED ROLLERS FOR PLANING MACHINES—B. Fitts, of Worcester, Mass. : Having thus fully described the construction and operation of my machine, I claim the arrangement of the gears, H and I, in combination with the eccentric, S, when constructed and operating in the manner and for the purposes set forth.

SELF-PRIMING FIREARM—G. W. B. Gedney, of New York City: I claim the pivoted chamber, or magazine, within a recess in the hammer head, substantially as set forth, and operated by a link pivoted to the lock-plate or some other stationary part of the pistol or other arm.

I also claim cutting off the priming of the edge of the hammer face as specified, and carrying the same into the proper position for exploding upon the nipple or cone, as described.

COMBINED LETTER AND ENVELOPE—E. B. Gleason, of Boston, Mass. : I claim the combination therewith (that is, the letter sheet) of the envelope, B, composed of the superscription and post-mark portion, d, and the single flap, e, or the same and the two flaps, c and f, arranged together and with respect to the letter or billet portion, A, as described.

BARREL PACKER—W. H. Glasgow, of New York City: I claim, first, The rotary cam, C, with barrel, J, attached in connection with the vibrating hammer, H, arranged to operate as described.

Second, The plate, E, having a rotary and a vertical reciprocating movement for the purpose specified.

Third, The cam, C, plate, E, and hammer, H, arranged for joint operation, substantially as and for the purpose set forth.

[Substances such as cement, plaster, sugar, flour, and the like, can be packed by striking the barrel that contains them, and this invention consists in giving the barrel while being filled a rotary motion, and subjecting it to a lateral and vertical jarring movement, either or both, simultaneously with the rotary movement, which shakes the contained powder into a compact state.]

APPARATUS FOR HEATING AND PURIFYING THE FEED WATER OF STEAM BOILERS—Jacob Guhmann, of Rochester, N. Y. : I claim the combination and arrangement of the bent siphon-shaped tube, D, constructed as described, having the induction and eduction openings at the highest parts thereof, with low receiving portion, D', whereby the water is made to pass a considerable space of vertical pipe the more effectually to depesit its impurities in D', both while descending and ascending, together with the waste-cock, G, and conjoint cocks, I H, lever, K, and connecting rods and cranks, as described, for simultaneously opening and closing the same, the whole constructed and operating substantially as and for the purposes set forth.

MACHINES FOR DRESSING HEELS OF BOOTS AND SHOES—Horatio Guild and Luther Hall, of Boston, Mass. : We claim the combination of the adjustable hub jaws and pattern thereof, with their curved supporting rack and the self-adjusting knife, or knife-frame, applied together and to a bed or table, or the equivalent thereof, and made to operate substantially as specified.

MEAT MINCER—A. W. Hale, of New Britain, Conn. : What I claim is, a cutting or mincing machine, operating by means of a cylinder, or cylinders, having tapering grooves extending from end to end, in combination with, and revolving in fluted or ribbed cases, A and B, and acting against a stationary knife, or knives, placed in a plane, parallel with the axes of the cylinders, the whole arranged substantially as and for the purposes set forth.

COMPOSITIONS FOR ROOFING—John Hobrecker, of Quincy, Ill.: I do not confine myself to the precise proportions named.

I claim the process described of preparing plastic material of the composition stated, without the aid of external heat for the purposes set forth.

SHIPS' LIGHTS—Enoch Hidden, of New York City : I claim, first, The swivel wrench of the button, and supporting the shaft or spindle thereof by the brace-piece, o, above the frame, substantially as and for the purpose set forth.

Second, The inclined surfaced button, as described, with swivel wrench, in combination with the slotted lug of the main frame, as set forth.

Third, In combination with the aforesaid construction, the attachment of the light frame, b, to the main frame, a, by means of the hook and pin, as described.

HOOP-LOCK FOR SECURING THE ENDS OF METALLIC BANDS—P. C. Ingersoll, of Green Point, N. Y. : I claim the loop, A, and key, B, fitted together and applied to the hoop, substantially as and for the purpose set forth.

[A metal loop is employed in this invention in connection with a metal key, so formed within the loop as to securely lock the ends of the hoop in the loop when properly adjusted.]

ROTARY PLANING MACHINE—H. C. Ingraham, of Guilford, and H. S. Ingraham, of Granger, O. : We claim the arrangement of the cylinder, F, with the two upper feed rollers, and the matching burrs, in combination with the vertical sliding frame, I, for the purpose of preserving the same thickness of timber between the face of the board and the tongue and groove, as set forth.

We further claim the sliding gripe, V, in combination with the ways, W W', lever, X, and ratchet, X', all arranged and operating in the manner and for the purpose set forth.

MODE OF OILING JOURNALS—D. B. Jordan, of Woonsocket, R. I. : I do not claim the invention of the hanger, B, or the dripper, D, or the girder, A.

I claim the combination and arrangement of the shafts, C, and 2, the disk, G, the sliding valve, H, and the spout marked C, constructed and operating substantially as and for the purpose described.

SPARK EXTINGUISHER—James Keniston, of Cincinnati, O. : I claim a tank arranged beneath the boilers of furnaces in such manner as to receive the sparks and cinders therefrom, and extinguish and discharge them, by means of a current of water passing through the tank, substantially as described for the purposes set forth.

LANTERNS—W. M. Kimball, and K. Hartmann, of Cleveland, Ohio.; We claim the segments, D and E, the spring, G, and arm, H, or their mechanical equivalents, in combination with the hooks, L and L', arranged and operating in the manner and for the purpose specified.

LOCKS AND LATCHES—W. S. Kirkham, of Branford, Conn. : I claim the combination of the nosing, D, provided with the double inclined flanch, E, with the bolt, or latch, C, having its outer end rounded and leveled in a vertical plane to operate in and for the purpose set forth.

[Locks or latches are generally incapable of being applied to doors which open from different sides; this invention consists in so arranging the bolts of the latch or lock, and also the "nosing" or keeper, whereby the lock is capable of being applied in proper position to a right or left hand door as may be desired.]

PEACH-CUTTING AND STONING APPARATUS—J. C. Kuhn of Boonville, Ark.; I claim the knives, E E, curved and crossing each other, as shown, and attached to the elastic bars, D D, in combination with the lever, F, provided with the pin, i.

I further claim the above parts, when placed on the box, A, provided with a tube, B, and the several parts arranged relatively with each other, so that the stones, H, will be separated from the pulp, or flesh, substantially as described.

[For preserving and drying, the stones have to be extracted from the peaches, and this invention is designed to cut them in pieces and remove the stone at one operation. It consist of two curved knives, which cross each other and are attached to elastic bars, used in connection with a tube placed vertically within a box, and a pressing lever.]

RAILROAD GATES—Shields Liggett, of Staunton, Va.; I do not claim the movement produced by the action of cars upon projecting levers, as such movement has been heretofore produced.

But I claim the opposite sliding sectional gate, in in combination with the levers, F, F', rods, g, g', and h h', levers, G G', sliding bars, I I', and springs, i i', arranged and operating as set forth.

STEREOSCOPES—William Loyd, of Philadelphia Pa.: I claim a stereoscopic instrument having eye glasses at opposite sides, and double reflectors in combination with a revolving picture holder, arranged substantially as described.

I also claim the grooves, e e, on opposite sides of the frames, b, for the purpose of holding two pictures in contact with each frame, as specified.

LOADING ORDINANCE—W. E. Moore, of Crawfordsville, Ind. : I claim, first, The combination with a cannon, or other piece of ordinance of a system of mechanism which will receive the charge, carry it opposite the bore of the cannon, force the same up to the breech of the cannon, and then be capable of being moved out of line with the bore of the same, substantially as and for the purpose set forth.

Second, In combining with the above system of mechanism, a needle for pricking the cartridge after it has been forced up to the breech, said needle coming into action simultaneously with the retreat out of line with the bore of the cannon, of the mechanism employed for introducing the charge, and then retreated out of the way, ready for the application and explosion of the cap, substantially as and for the purposes set forth.

Trird, The combination of a cap charger and exploding hammer with the first and second systems of mechanism above claimed, whereby simultaneously with the retreat of the needle a cap is brought over the touch hole, and exploded, substantially as and for set forth.

Fourth, A cartridge box, which has a yielding spring stop, in combination with the first system of mechanism above mentioned, substantially as and for the purposes set forth.

CAR BRAKES—W. E. Moore, of Crawfordsville, Ind.: I claim, first, Making the windlass chain shaft in two parts, F K, and uniting said parts by a universal joint, L, and arranging the main friction roller, J, one section of the shaft, F K, and the windlass drum on the other, substantially as and for the purposes set forth.

Second, The employment of an auxiliary friction roller, O, in combination with main roller, J, and locomotive driving wheels, B, when said auxiliary roller, O, is arranged to rise between the main friction roller, J, and the locomotive wheel, B, through the peculiar scale beam or weighing arrangement, G G', N, i s k d e F, substantially as and for the purposes set forth.

Third, The employment of a pivoted pawl, H, in combination with a ratchet drum, G, having two circles of reverse set teeth, f f', which incline on their deepest faces toward the center of the drum, substantially as and for the purposes set forth.

BOTTLE STOPPER FASTENINGS—H. W. Putnam, of Cleveland, Ohio. : I claim the bottle stopper fastening formed of two pieces of wire, the same being united by means of the points, B B, passing through the loops, E E, constructed and having the wire, A, adopted to them, as herein described; thus forming a hinge, and securing the same to the neck of the bottle, by looping together the ends of the wire, D, the several parts being constructed in the manner and operating as set forth.

MODE OF APPLYING SPRINGS AS A MOTIVE POWER—G. W. Morgan, of Prattsburgh, N. Y. : I do not claim the use of wheels and pinions, operated by springs, nor two or more shaft; nor the duplication of wheels, nor the application of springs on both sides of the motor wheels, for all these are known devices.

But I do claim the arrangement of the springs, B B, etc., wheels, D D, etc., with lugs, a a a, pinions E E, etc., concentrating the power on the pinions, H H, on each side of the wheel, I, and the pinions, N N, and shafts, R R, for winding up at the same time, all the springs, on either side of the wheel, I, when the whole are constructed and operated, for joint action, as described.

SPEAKING TUBES FOR SHIPS—D. S. Neal, of Lynn, Mass. : I do not claim inventing a tube, or an iron, copper, or brass bound key.

But I claim the arrangement of the speaking tube with a cask, or equivalent float, substantially as and for the purpose specified.

MEAT CUTTER—J. G. Perry, of Kingston, R. I. : I claim, first, placing the knives on or across the shaft and holding them by their ends, to prevent them from turning, substantially as described.

Second, I claim the manner of constructing the shaft and stud plates, substantially as and for the pursose set forth.

FASTENING FOR FOLDING DOORS—E. S. Roberts, of Brooklyn, N. Y. : I do not claim, broadly, the employment or use of sliding bolts, D D, attached a to knob spindle, so that they may be moved in and out from a door, by turning the same, for such device is quite old, and in common use.

But I claim the combination of the sliding bolts, D D, and H, applied to folding doors, to operate substantially as and for the purpose set forth.

[The object of this invention is to supersede the vertical slide-bolts, as they have hitherto been applied to one of a pair of folding doors, by combining the bolts with a horizontal slide-bolt, so arranged in relation with the lock on the other door of the pair, that both doors cannot be closed and locked without first moving the vertical bolts and locking the door to which they are applied, thereby answering the purpose of fastening and securing both doors.]

STEERING APPARATUS—G. W. Robinson, of Boston, Mass. : I claim the segment, M, having teeth on the interior vertical face of the curve, in combination with the gears, D E, and F, and shaft, G, connected with the tiller, and moving therewith, and arranged and operating in the manner substantially as set forth.

PREPARING HOP LIQUOR FOR BREWERS— A. S. Rollins, of Albany, N. Y.; I claim the preparation of hop liquor, for the purposes of distilling and brewing by the process set forth.

WATER WHEEL—P. H. Roots, of Connersville, Ind. : I claim the wheel, A, and rotating breast or abutment, E, moving with different degrees of velocity, in combination with the apron or concave, D, the whole being arranged to operate, as and for the purpose set forth.

[This invention consists in using in connection with a horizontal wheel provided with radial buckets, a rotating breast or abutment, and a concave or apron so arranged, that the water is made to act in a very direct and efficient manner on the wheel.]

WASHING MACHINE—J. L. Rowley, of Angola, Ind. : I claim constructing the bottom of the box, with three sides of an octagon; the two outer sides to have ribs of an octagonal shape, set at an angle of 45° with the sides of the box and bottom to be horizontal, with two rows of rubbing pins or knuckles set alternately with the valleys between the ribs, D D, in combination with the vibrating rubber, having the rubbing surface octagonal, and the rubbing knuckles set so as to work alternately, with the spaces between the pins in the bottom of the box, and diagonally with the ribs on outer sides of the bottom, B B, in the manner and for the purposes set forth.

CAST-IRON RAILS FOR RAILWAYS—J. E. Russell, of Brooklyn, N. Y. I claim as an improved article of manufacture, a cast iron railroad rail, having its neck vertically corrugated, as shown and described.

[These cast iron rails are constructed with their necks corrugated vertically, by which form of the neck, the necessary support for the head is not only obtained with less metal than would be requisite in a straight neck, but the liability of the rails to be fractured by their contraction in cooling is obviated in a great degree; and one of the objects of the invention is, the casting of rails with chilled faces which will make them far more durable than rails of wrought iron.]

APPARATUS FOR EVAPORATING SUGAR JUICES—James Smart, of Mansfield, Ohio : I claim, first, In the construction of pans, the combination of the inclined bottom, A, with the inclined zig-zag partition, C D, substantially as and for the purposes set forth.

Second, The combination of two pans, B B', and two flame chambers, G G', of the peculiar construction, described, substantially as and for the purposes set forth.

Third, Supporting the pans at or near the center of their length, by pivots, a a, and at their ends by spiral springs, b b, substantially as and for the purposes set forth.

MACHINE FOR FREEZING CREAM, ETC—S. W. Smith, of Brooklyn, N. Y. : I claim, first, the cylinders, D E, in combination with the scrapers, H H, and reservoir K, constructed in the manner substantially as described and for the purpose specified.

Second, Combining with the cylinders a perforated distributing reservoir, for the purpose of furnishing the material in the desired quantities to the cylinders, and operating in the manner substantially as set forth.

ELECTRO-MAGNETIC MEDICAL APPARATUS—Heinrick Soltmann, of New York, N. Y. : I do not claim the vibrating armature, neither do I claim the glass cylinder, in itself, as a regulator of electrical currents, but I claim the arrangement of the vibrating spring armature and the connections therefrom, in combination with the key, S, arranged and acting as specified, to throw the shock off the person, or repeat the same as set forth.

I also claim the regulating cylinder, t, constructed as specified, in combination with the medical electrical machine, fitted and acting in the manner and for the purposes set forth.

LEVER JACKS—Frederick Stamm, of Lampter, Pa. : I claim the combination and arrangement of the lever and link rod, hinged together, with the block and link seats, as described and for the purposes set forth.

ROTARY STAVE MACHINE—George Starkweather, of Hartford; Conn. : I claim the horizontal revolving cutting rims, D C, for dressing staves on the two opposite sides at the same time, arranged and operating substantially as described.

Second, The arrangement of one or more feed boxes, X, upon the plate, u, over the cutters, G, with the feeder, produced from the worm, a, for the purpose described.

SUGAR MILLS—T. E. Hunt, (assignor to himself and N. T. Hunt,) of Indianapolis, Ind. : I claim, first, the combination and arrangement of the frame, B, rollers, C C C C, and gearing, E E E E, with the cone, D, gearing F, bolt, G, and spring, J, when constructed and operated substantially as and for the purposes set forth.

Second, The trough, N, with aperture, O, when constructed as and for the purposes set forth.

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DEVICE FOR RAISING WATER—D. E. Teal, of Norwich, N. Y. : I claim the arrangement of means recited, the same consisting of the rope, or chains, the hooks, K, bail, F, of the cast iron box ; adjustable flanges, collars on the windlass, and the windlass, whereby the bucket can be lowered, filled with water, raised and emptied, by merely turning the windlass as described.

WASHING MACHINE—G. W. Tolhurst, of Liverpool Ohio : I claim the shaft, F', blocks, H H, and wedges, G G, or their equivalents, in combination with the oscillating rubber, C, slatted bottom, B, dirt chamber, A', and box, A, the whole being arranged and operating in the manner and for the purpose as set forth.

SAIL WAGON—William Thomas, of Benton County, Ark. : I do not claim the application of sails and steering apparatus to vehicles for transportation by land ; neither do I claim the sprayed spokes and suspension rods used in the strengthening of the wheel ; they are well known.

But I claim, first, The combination of the spars and cargo-box, on the rocking shaft, a, thus lowering the center of gravity, and increasing the stability of the fabric, not only in this way, but by also and as another effect thereof, allowing the sails to yield to violent gusts of thwart wind, receiving their force gradually, and spilling it more and more as they decline,

Second, I claim the invention of the hollow wheel-hub, which I have called the barrel hub, to be used for the purposes of freight, thereby relieving the axle, avoiding friction, and adding to the power of the vehicle to stand up safely against strong cross winds, the various parts being arranged in the manner and for the purposes set forth and described.

LOCOMOTIVE FIRE-BOXES—W. R. Thomas, of Catasauqua, Pa. : I do not claim, broadly, the employment of a movable lining in a fire-box ; but I claim the removable lining, B, fitting with the shell and under the permanent water spaces, a a, of the fire-box, having inwardly projecting inclined sides, and combined with the water spaces of the boiler, by mean of two rows of vertical tubes, c c, entering the crown sheet, and a pipe, e, connecting with the body of the boiler, substantially as described.

[This invention consists in a certain construction of a hollow lining for the fire-box of a locomotive or other boiler, and mode of combining the same with the water spaces of the fire-box and body of the boiler, whereby provision is made for a free supply of water to the said lining, and for the exit of the steam generated therein, and also for the removal of the lining for repairs, or its replacement by a new one when burnt out.]

RAILROAD CAR JOURNAL-BOXES—Philip Umholtz, of Tremont, Pa. : What I claim is, the spring yoke bolt, c, in combination with the follower, b, and packing, g, operating in mortise, D, of box, A, in the manner described and for the purposes set forth.

HORSE POWER—J. S. Upton, of Battle Creek, Mich. : I do not claim as my invention, any mere arrangement of external with internal gear, to produce accelerated motion by wheels toothed on one side or face, as such combinations are seen every day, in endless variety.

But I do claim the arrangement of driving wheel, G, with the pinions, E E E, and wheels, F F F, in combination with the annular wheel, O, with toothed gear on its internal edge and on one of its faces, for the purpose and in the manner substantially as set forth.

CLASPS FOR THE ENDS OF BANDS OF IRON—Chapman Warner, of New York City. : I claim the construction of a clasp of any material or dimensions substantially of the form described, and illustrated by the accompanying drawings, with two wedged shaped projecting tongues, placed in the position, fitted with sleeves and protected by sides, as mentioned.

RAILROAD CAR COUPLING—N. H. Wentworth and M S. Ames, of Somersworth, N. H. : We claim combining with each latch, or catch, a lever, as described, and providing the latch and lever, when thus combined with the cams and their shafts and crank-arms, for actuating them, as and for the purposes set forth.

BREAD-MAKING TABLE—W. K. Wyckoff, of Ripon, Wis. : I claim the combination and arrangement of the flour chest, A, the table or molding board, B, the mixing tray, C, and the closet, D, substantially as described and for the purpose specified.

STEERING WHEEL—C. T. E. Blaich and P. A. Bishop, (assignors to P. A. Bishop,) of Elyria, Ohio : We claim the vertically sliding-dog being secured in suitable brackets, and provided with a foot-piece, pawl, and joint, as described, in combination with the spiral spring and ratchet, the whole being constructed and operated as set forth.

SEWING MACHINES—E. S. Boynton, of New York City, (assignor to P. R. Roach,) of Elizabeth City, N. J. : I claim the use of the adjustable fulcra for controlling the feed of the needle, in combination with an annular or ring-shaped shanked wire needle, as attached directly to the crank shaft, without the intervention of a needle box, substantially as set forth.

HANGING RECIPROCATING SAWS—Addison Crosby, (assignor to H. S. Stephens,) of Fredonia, N. Y. : I claim the two jaws or plates, B B, applied to the saw, A, connected together and suspended within the swinging or pivoted adjustable frame, C, which is attached to the plates, g g, the whole being arranged as and for the purpose set forth.

[The ends of the saw, in this invention, are grasped, each by two jaws, so connected and arranged within an adjustable swinging frame, that a universal joint connection is obtained and the saw at all time subjected to an equal strain, and rendered capable of being set in line with its work with the greatest facility.]

RE-ISSUES.

MACHINERY FOR PREPARING OVAL PICTURES—William Garmer, of New York City, Patented August 17th, 1858. : I claim as a means of preparing oval picture frames, a lathe with a face plate revolving in an oval path, in combination with a scraper adapted to the form of the desired molding of the oval frame, when the said scraper is so arranged as to be self-adjusting laterally with the said molding, substantially as and for the purpose set forth.

HARVESTING MACHINES—W. A. Kirly, of Buffalo, N. Y. Patented September 2d, 1856. : I claim, first, the combination of the single plate, H, and main wheel, substantially as described.

I also claim the combination of the main wheel, k, single plate, H and rim, L, when connected together and operating in the manner and for the purpose set forth.

I also claim placing the vibrating wheel on the outside of the frame, or so that the outside of the frame does not bear on the outside of the wheel, in combination with the triangular-shaped frame on the inside of the wheel, substantially as described.

I also claim hanging the seat to the plate, H, and to the staudard, S, in the manner and for the purpose set forth.

I also claim a hinged lever seat and outside stirrup or supporter in combination with a wheel having no outside frame or support, substantially as represented.

MACHINERY FOR ENAMELING MOLDINGS, ETC—Rober Marcher, of Cornwall, N. Y. Patented October 21st, 1858. : I claim in coating or enameling the surface of moldings, the employment of a plate whose lower edge is formed the reverse of the trasverse form of the molding to which it is applied, when such plate is made self-adapting to the surface of the molding during the longitudinal movement, substantially as described, and for the purpose set forth.

I also claim the employment of a hopper to contain the composition for enameling when the lower edges of the end plates thereof are formed the reverse of the transverse form of the molding, and the molding to be enameled is employed as the bottom of such hopper substantially as described and for the purpose set forth.

AMALGAMATOR—Lewis Solomon, of New York City, Patented December 7th, 1858 : I claim, first, The use of elongated amalgamating chambers, I, when arranged to operate in the manner and for the purposes specified.

Second, The arrangement of the amalgamating chambers, I, within a heated chamber, A, for the purposes specified.

STEAM GAGES—Thomas Stubblefield, of Columbus, Ga. Patented July 18th, 1854. : I claim the combination of a case perforate at both ends with a spring valve, the spring forming the sides of the valve being arranged so as to cut off communication between the perforations in the opposite ends of the case, and perform the duty of a manometer spring as described,

INVENTIONS EXAMINED at the Patent Office, and advice given as to the patentability of inventions, before the expense of an application is incurred. This service is carefully performed by Editors of this Journal, through their Branch Office at Washington, for the small fee of $5. A sketch and description of the invention only are wanted to enable them to make the examination. Address MUNN & COMPANY,
No. 37 Park-row, New York.

Habits of Bewildered Persons.

MESSRS. EDITORS—In a late number of your paper you state, in answer to some correspondent, that you have no confidence in the report that "when a man is lost he will travel in a circle." In this you are certainly mistaken ; it is a fact well-known to all frontiersmen that, when persons are bewildered, they frequently travel in a perfect circle, sometimes keeping the same track until they have made half a dozen equal rounds ; at other times making the circle larger or smaller each time. It is not by any means always the case, when a person is lost ; but it is so frequent that it is within the experience of every-one who has been much in the woods. In calm and cloudy weather, and in a country of much sameness of appearance, the best woodsmen get so bewildered as to "take the circles." Persons not accustomed to the woods will sometimes do so, when the sun is shining and a steady breeze blowing. On the level or gulf prairies of this country on a calm, foggy morning, no man can travel without a road. It is an incident of everyday occurrence in the Spring and Fall seasons, that men are thus becalmed on the prairie as effectually as are ships at sea ; nor will a compass mend the matter, for it cannot be carried steadily enough to keep its meridian, and the course it points cannot be kept for fifty yards ; if a man attempts it, he will make a circle and come back to the place he started from. The circle will be larger or smaller generally in proportion to the density of the fog—sometimes only a hundred yards in diameter ; at other times a mile, but seldom more. The circles thus made are perfect. This kind of wandering seems to arise from an attempt to go a straight course when there is nothing to guide the senses, or when the usual guides of sun, wind, or the general contour of the country are disregarded. It rarely befalls children, who do not attempt to go on a *course*, but only run from one visible point to another equally perceptible.

Many apparently trivial traits in the disposition of animals, which are of great use to woodsmen, are omitted in books of natural history ; chiefly from ignorance, no doubt. One of these is the disposition of a horse, when frightened, to run *against the wind*, if any is blowing. Thousands of horses which would be otherwise irrecoverably lost annually, on this frontier, are recovered by observing this simple rule in pursuit. All animals have similar inexplicable traits in their disposition ; and men are no exception to the rule. White men, when they are scared, will retreat *in the same direction in which they came.* The Indians know this, and lay their plans accordingly ; and many a gallant company has been cut to pieces, simply from ignorance of this fact. But those who understand these matters, when they find it necessary to make a hasty retreat, always do so in a straight line, and in a direction different from the one in which they came.

We frequently see notices in northern papers of children being lost. Such things rarely occur on this frontier ; though children often wander, and there are but few neighbors to help to search for them. Perhaps, the cause of humanity might be subserved by publishing a few rules to be observed in such searches. Any child will make a track or trail plain enough to be follow by the eye, over any ground, unless there be much passing of men or animals to spoil the trail ; and it can be followed by almost any person of good sight, although he may not have had any previous experience. Go to the place where the child was last seen, and look for the trail, glancing along the ground with a sharp scanning look ; when it is found, a faint kind of a line will be seen, which may be followed at a fast walk, until a well-defined track occurs. If the trailer stops to look for track, he will propably lose the trail, and must go back and take it up again with the same scanning glance along the ground. The trail which hunters and Indians follow skillfully, is not so much composed of tracks or footprints, as of indescribable little signs, such as leaves and blades of grass bent or turned, twigs broken, and other things so small and faint that they cannot be shown to any one, yet which, when all put together, make a kind of *line* along the ground, which line can be seen by a rapid glancing look, but which will disappear when looked at steady. The trail of a human being is more easily followed than that of any other creature, because there is a kind of *purpose* in it, different from the trail of irrational animals. A child will change its course around every thick clump of bushes, and go nearly straight where the ground is open. If it is scared and running, it will run *from* the wind, if much is blowing, and from any voice it hears ; in such cases, therefore, it is not good policy to call much upon the lost child's name. M. M. K.

Goliad, Texas, March, 1859.

The Value of a Bit of Knowledge.

In the course of our miscellaneous reading, we came across the following good story, which illustrates the value of a bit of practical information, when applied at the right time :—

In the Plazza before St. Peter's at Rome stands the most beautiful obelisk in the world. It was brought from the circus of Nero where it had lain buried for many ages. It was one entire piece of Egyptian marble, 72 feet high, 12 feet square at the base, and 8 feet square at the top, and is computed to weigh above 470 tuns, and it is supposed to be 3000 years old. Much engineering skill was required to remove and erect this piece of art ; and the celebrated architect, Dominico Fontane, was selected and engaged by Pope Sextus V. to carry out the operation. A pedestal, 30 feet high, was built for its reception, and the obelisk brought to its base. Many were the ingenious contrivances prepared for the raising of it to its last resting place, all of which excited the deepest interest among the people. At length everything was in readiness, and a day appointed for the great event. A great multitude assembled to witness the ceremony ; and the Pope, afraid that the clamor of the people might distract the attention of the architect, issued an edict containing regulations to be kept, and imposing the severest penalties on any-one who should, during the lifting of the gigantic stone, utter a single word. Amidst suppressed excitement of feelings and breathless silence, the splendid monument was gradually raised to within a few inches of the top of the pedestal, when its upward motion ceased ; it hung suspended, and could not be got further ; the tackle was too slack, and there seemed to be no other way than to undo the great work already accomplished. The annoyed architect, in his perplexity, hardly knew how to act, while the silent people were anxiously watching every motion of his features to discover how the problem would be solved. In the crowd was an old British sailor, he saw the difficulty and how to overcome it, and with stentorian lungs he shouted "Wet the ropes!" The vigilant police pounced on the culprit and lodged him in prison ; the architect caught the magic words, he put this proposition in force, and the cheers of the people proclaimed the success of the great undertaking. Next day the British criminal was solemnly arraigned before his Holiness ; his crime was undeniably proved, and the Pope in solemn language pronounced his sentence to be—that he should receive a pension annually during his lifetime.

These little facts stored up from observation, can never do the owner any harm, and may some day be of great utility ; and this story only proves the value of remembering small things as well as great ones, for nothing that is useful is too insignificant for man to know, and there is no knowledge that has not its use.

Noises in the Sick Room.

It is extraordinary how many persons, unused to the sick room, mistake certain noises for quiet. When such people have to walk across the room they do so with a balancing sort of movement that makes every plank creak uneasily. Their very dress rattles in a way that would make the fortune of a rattle-snake. If anything has to be said, it is spoken in a loud whirring whisper, that conceals the words but makes the most irritating of noises. Now the silence of a sick room must not be labored, it must be natural. Shoes that do not creak must be worn, and in walking the foot must be put down carefully, of course, but with a firm step, that comes gently, yet steadily, on the floor. This will not make the creaking sound caused by the toe-pointed, gingerly mode of movement so much adopted by those whose experience of sick rooms is small. The dress must be made of some noiseless material, wool or cotton ; silk must be avoided, for it squeaks with every movement. In speaking, the pitch of the voice must be slightly raised, and the words, instead of being hissed, as in whispering, should be clipped short, and cut distinctly. By this means the person spoken to will hear what is said, while the least possible sound accompanies the word.—*Barwell's Cure of the Sick.*

Anti-Bad Luck Society.

From the earliest times to the present, superstition has been an ever-present quality of the human mind, and persons who were themselves superstitious have loudly decried it in others. This was their idea of reform. Even in this enlightened age, the old household beliefs are held by many with great pertinacity, and no argument will convince them of their fallacy. The only way to do this is to prove the position that the belief is nonsense, by a bold defiance. Some brave Frenchmen are trying to do this. A society has been formed at Bordeaux to put down the superstition of evil omens. As everybody knows, it is "bad luck" to begin anything on a Friday, or to sitdown at a table with thirteen, or to balance your chair on one leg, or to spill salt between yourself and friend. The new society propose to have regular dinners on Friday, to have thirteen guests, to turn chairs on one leg, and spill salt around before commencing. In the whole year, during which ill-luck has been thus defied, no single fatality has occurred to any member.

A Foreign Safe.

We had entertained the opinion that we made the largest and the only real good fire-proof and burglar safes in the world, but they seem to equal us in London. One of our foreign cotemporaries describes a safe made by J. Tann, London, for a bank in Saragossa, Spain, which appears to be as large as any we have yet seen in this city. It weighs 9 tons, and is 8 feet 6 inches, by 12 feet 4 inches in dimensions. The outside is composed of half-inch boiler plates, and the interior filled with a non-conductor, and made in every respect similar to an American safe. As these kind of safes are an American invention—as we understand the subject—this is one new art which we have taught our friends on the other side of the Atlantic.

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New Inventions.

New Projectile.

That veteran inventor of destructive missiles—Capt. J. Neston,—has lately been astonishing the Royal Engineers, at Chatham, England, with a new liquid rifle-shell. The object of this projectile, is, to set fire to army equipage, also the sails, rigging and even the hulls of vessels. This shell is about four times the size of an army conical rifle bullet, and is hollow. The interior contains a glass case in which is placed the liquid fire; the chief ingredients of which are phosphorus dissolved in bisulphite of carbon and a little chlorate of potash. When this shell strikes an object, the glass case is broken, its contents are ignited and scattered about, setting on fire every combustible object with which they come in contact. The gallant captain fired a number of these with a heavy three grooved rifle at sacks placed at a considerable distance on poles to represent the sails of ships, and although they had been soaked with rain, they were set on fire and burned with a very few shots. The bullet used is intended to carry 1,800 yards distance, and will set fire to tents and blow up the enemy's ammunition, wagons of gunpowder bags and baggage.

New Rope Machine.

In all the machines now employed for making rope, the strands from which the rope is to be made have to be twisted, and a separate bobbin employed for each strand. The machine which is the subject of our engraving saves the twisting of one strand, taking the hemp in an untwisted state and twisting it as the rope is made. The principle is applicable to all fibrous materials, either cotton or silk, and will, we are sure, effect a great saving of time and money, in the manufacture of cords and cordage of all kinds and of any degree of fineness.

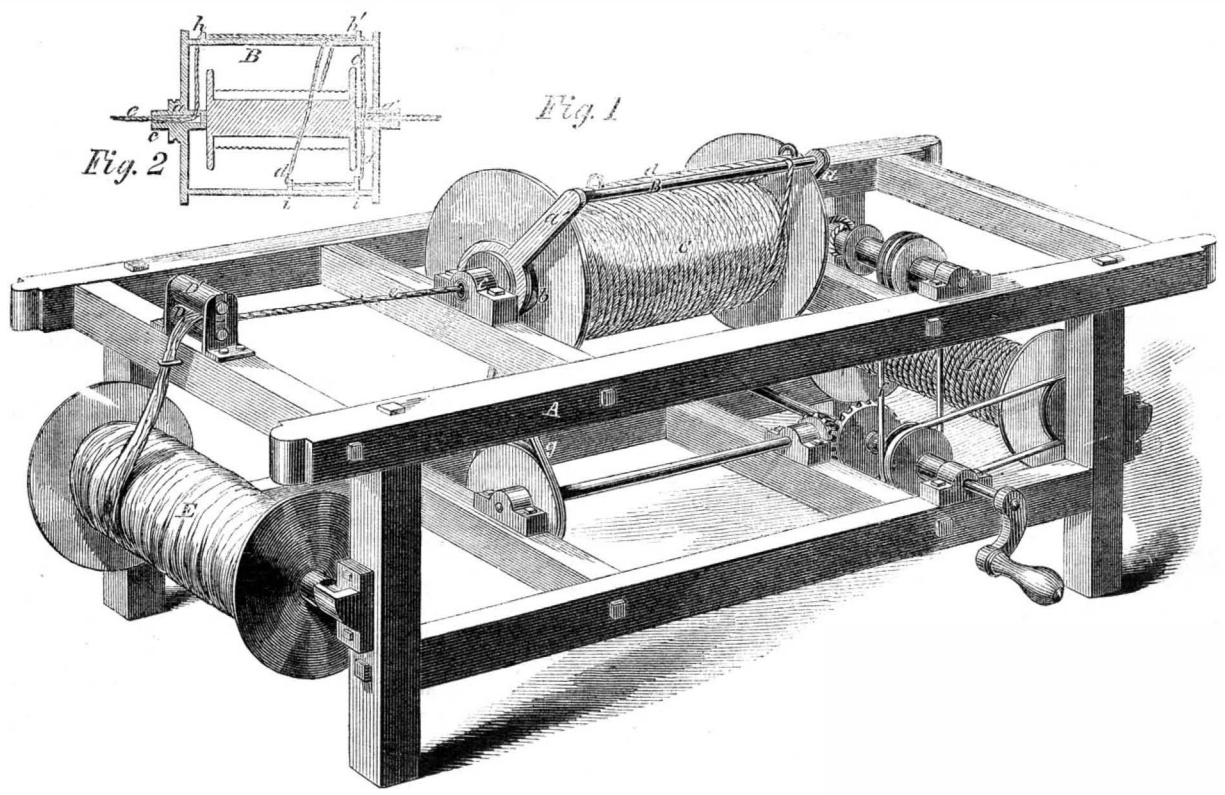
Fig. 1 is a perspective view and Fig. 2 a section of the flyer, showing the twisting operation.

A is a suitable framing containing the bearings for the flyer, B, and other mechanism employed. The flyer, B, has an opening, *c*, through the center of each of its heads, *a a'*, and it contains a bobbin, C, which is fitted to turn on a central spindle, *b*, attached to one or both the heads, *a a'*, in such a manner as not to interfere with the central openings, *c c*. The said bobbin, C, carries yarn, *d d*, which has been spun by the usual or any convenient means previously to its being introduced to this machine. Near one end of the flyer there is arranged a pair of rollers, D D', which are arranged in bearings on the frame, A, and between which the sliver or roving, *e*, which is to be first spun and then twisted along with the yarn, *d d*, passes to the flyer from a bobbin, E, or a suitably arranged can. The rollers, D D', are allowed to be revolved freely by the friction of the yarn produced by the weight of the upper roller, D'. F is a spool arranged near the opposite end of the flyer to the roller, D D', and having a positive rotary motion imparted to it by a band, *f*, from suitable driving apparatus. The flyer has also a positive rotary motion imparted to it by a band, *g*, from the driving apparatus.

The sliver or roving, *e*, which may be drawn and prepared in the usual way before being brought to this machine or by suitable mechanism while on its way to the machine, enters the flyer through the central opening, *c*, in the head, *a*, next the rollers, D D', and thence passes through guides, *h h'*, attached to one side of the flyer, and thence to the opening, in the other flyer head, *a*. The yarn, *d d*, passes from the bobbin, C, through guides, *i i*, attached to the other side of the flyer, and thence to the opening, *c*, in the flyer head, *a'*, where it meets the sliver or roving, *e e*, and from whence both pass together to the bobbin, F. The revolution of the flyer causes the sliver or roving, *e e*, to be spun between itself and the rollers, D D', and at the same time, causes the said sliver or roving, after being spun, to be twisted with the yarn, *d d*, between their point of meeting, and the spool, F, which by its revolution on its axis, takes up the twist thus produced. It will be observed, on examination, that the twist given to the sliver or roving, *e e*, between the rollers, D D', on the flyer, is the reverse of that produced in twisting it with the yarn, *d d*, the direction and amount of whose previously produced twist must also correspond with that given to the sliver or rovfng, *e e*.

It will be obvious to all persons skilled in the spinning and twisting process, that by spinning the sliver or roving, *e e*, by the operation of making the twist, the machinery which would otherwise require to be used to spin it is dispensed with, and the time that would be occupied in spinning it is saved,

PITTMAN'S SPINNING MACHINE.

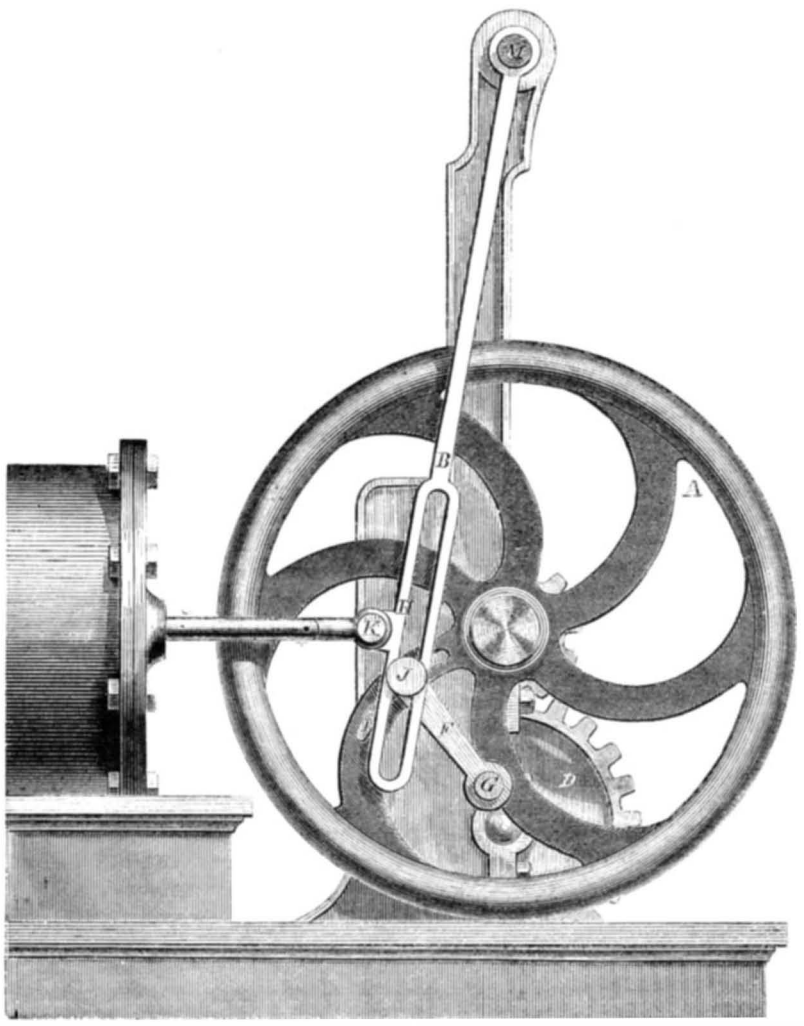


besides which the said sliver or roving is spun into yarn without a traverse motion on the flyer. The flyer operated in this way may be made to carry two or more spools of spun yarn, so that the sliver, *e e*, may be twisted along with two or more yarns instead of with one, as above described.

A circular plate or disk occupying the position of the flyer head, *a*, may be substituted as the equivalent of the flyer to carry the bobbin, C, and the sliver or roving, *e e*, may be conducted through the center of the bobbin, while the yarn, *d d*, passes through a guide attached to the said disk by which the same effect will be produced by thus dispensing with the flyer, the speed may be increased.

The inventor of this valuable machine is G. W. Pittman, of Bushwick, N. Y., and he has assigned the invention to Charles L. Frost, of 40 Broad st., New York City, from whom any further information can be obtained. The patent is dated Jan. 25, 1859. It is one of the greatest improvements in rope-machines that have been made for some time.

SMEAD'S DEVICE FOR CHANGING MOTION.



The common crank, it would seem, is to pass away and retire into respectable oblivion, while the subject of our engraving takes its place, as the means of converting rotary into reciprocating motion and *vice versa*.

Our illustration shows the invention applied to a steam-engine, to convert the reciprocating motion of the piston into the rotary motion of the fly-wheel and geared wheels. It is applied by the inventor to dash churns, where the turning of a handle attached to D gives an up and down motion to the dasher.

A is the fly-wheel carrying on its shaft the cog-wheel, E, that gives motion to the wheel, D. Secured to one of the spokes of A is a pin, G, on which the arm, F, moves as a center, and a pin, J, in the other end of F passes through a curved slot, I, in another spoke of A and this, by a screw, can be secured nearer to or further from the center of A, as may be desired, to vary the relation between the motion of A and the piston. The pin, J, is free to move up and down in the slot, H, of the swinging bar, B, that is pivoted to the frame by a pivot, M. To one side of the slot, H, the piston rod, C, (provided with a joint, L,) is pivoted by a pin, K, and by consulting the illustration it will be easily seen how the back and forth motion of C communicates the rotary motion to the fly-wheel, or *vice versa*.

The inventor states that by this very simple arrangement of means, these motions may be be converted, the one in the other, with the the least possible loss or absorbtion of power by friction, and applicable to every machine where these two motions are required.

It was patented Feb. 15, 1859, and the inventor E. A. Smead, of Tioga, Tioga county, Pa., will be happy to furnish any further information on being addressed at that place.

We see it stated in an exchange that the Hon. James Hughes, of Indiana, has declined the office of Commissioner of Patents. At the time of going to press no appointment had been made, although some new names have been suggested; among the number is the name of Thomas H. Dodge, Esq., of New Hampshire, formerly Chief Examiner in the Office and Chairman of the Board of Appeals. He distinguished himself while in the Office for his devotion to its interests, and was a warm friend of Mr. Holt's administration.

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Scientific American.

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REMOVAL.

The SCIENTIFIC AMERICAN *Office has removed from its old location,* 128 *Fulton st.* (*Sun Building*), *to No.* 37 *Park Row* (*Park Building*), *where all letters, packages, and models should hereafter be addressed. Entrance is had to the office also at No.* 145 *Nassau st. Munn & Co.'s American and European Patent Agency is at the above office.*

Engineering Precedents—Gun-Boat Propellers.

Our navy is sadly deficient in steam vessels of light draught, and as a consequence, we have had to send, on several occasions, a huge frigate with its heavy armament and large crew of three or four hundred men, upon missions which could have been fulfilled equally well with a light bull-dog, carrying only two or three twenty-four pounders, a ten-inch gun and a crew of but thirty or forty men. It is no wonder, under such circumstances, that an increase of our steam navy in vessels of light draught has recently been advocated both by statesmen and the public press, and that the efficiency of the British gun-boats during the Crimean war has been held up as an incentive and example to follow after. As measures have really been taken by our Government to construct several vessels of this character, it is well that we should look a little further into the subject, to see that we are right before we steam ahead and involve an immense national expense for defective war vessels. A very opportune and able work, affording much light and knowledge on this question, has just been published by H. Balliere, of this city, the author of which is B. F. Isherwood, Chief Engineer, U. S. Navy. It is a thoroughly practical production, and all the conclusions are based upon reliable data.

While on a late cruise in an American frigate on the Chinese coasts, Mr. Isherwood made many experiments on the British gunboats employed in the capture of Canton; and through the courtesy of their engineers, he took the dimensions and forms of their hulls and machinery, inspected their log books, and received candid accounts of their performances.

These war boats were divided into three classes, having engines of 40, 60. and 80 horse power. They varied in length from 100 to 125 feet; in breadth they were all 22 feet. They carried a few 24 pounders and one or two 10 inch guns each; their draft of water was light and they did very good fighting service, but they appear to have been very defective in their machinery, and it is to this point we wish to direct attention, so as to warn our marine engineers against committing such errors. As is the case with all British steamers, these were driven with screws; the engines were all made by two London firms—Maudsly and Field—of high engineering reputation. These engines were all direct-acting; the piston-rods being yoked to the screw shaft, to make them compact, and they were high pressure and non-condensing. Regarding the operative effect of such engines, Mr. Isherwood says: "The machinery of these boats was forever getting out of order in China, and both boilers and engines gave continual trouble; the first from the use of high pressure steam and salt water; the last from the high rotatory velocity employed. In fact the rotatory velocity of the engines was so great that it was impossible to keep them in order." He also adds:—

"For economy of fuel, durability, and reliability as war vessels in constant use, the machinery of these boats cannot be recommended."

We take it for granted the above conclusion is to the effect, that when a high velocity is to be given to a propeller, direct-acting engines are not the kind which greater be employed, because, although they may be compact, yet the great amount of tear and wear involved in their high velocity render *nil*, all the advantages of greater simplicity.

Some exceedingly useful information is also furnished regarding the effects of the different kind of propellers used, of which there was quite a variety, such as Griffiths', Mitchell's Boomerang, and several modifications of the common screw. There are great differences of opinion among engineers regarding the superiority of one screw over another, but the best results in fifteen gun-boats seem to have been secured by a common screw of uniform pitch and length from hub to periphery, except that the corners of the blades were rounded off on a radius of 18 inches. In regard to modifying the outline of screw blades, Mr. Isherwood says: "No taperings of the latter out or in or inclinations of them from a perpendicular to the axis either in a longitudinal or lateral direction, and no removals radially of the surface by the substitution of globes around the hub, or by other means, can add anything to the propulsive efficiency of the helicoidal surface, and they generally entail serious practical inconveniences. The only improvement possible on the true screw of uniform length from hub to periphery, is that due to the use of an expanding pitch or a curved directrix."

Such hints and many more like them in this work are most useful to our naval engineers and all those engaged in building propellers. As all our steamships will yet come to this system of propulsion, which is superior to the paddle wheel, we advise our engineers to treasure up all such information and use it to the best advantage. We can only progress by using the information obtained by the experience of those who have gone before us, to avoid their faults and redeem their errors.

Vegetable Parchment.

Common parchment made of the skins of animals, is of very ancient origin, and its discovery comes down to us in a somewhat mythical form. A king of Pergamus receives the honor of being its inventor, he being stimulated to produce this substance by the prohibition of the *papyrus* from Egypt—an edict once made by some of the "old fogy" authorities of that country. It was first employed for writing upon, and formed the material of all the ancient books and illuminated manuscripts made by the monks before the art of printing was discovered. It is still used extensively for important legal documents—such as patents, &c.—intended for long preservation; its great strength and durable qualities rendering it eminently adapted for such objects. The finer qualities of it only are thus employed; these are made from lamb, young kid, and calf skin, which undergo several tedious operations to complete the manufacture. These skins are first unhaired, then steeped in lime vats to remove all the fat and grease, after which they are taken out and washed, and are fit for framing. Each skin is perforated with a series of holes around its edges, to which cords are attached and secured to a movable frame, by which the whole skin is stretched in all directions, so as to take out every wrinkle and make it thin and smooth. It is also scraped with a blunt knife, and rubbed with pumice stone and pipe-clay to give it a clean even surface; then it is dried in the atmosphere shaded from the sun. After these processes, it is next pared and brushed before it is fit for writing upon; and it must not contain a particle of grease or else it will repel ink.

The skins adapted for making parchment are very scarce, and the processes through which they have to pass render the material produced from them expensive. Could it be obtained in greater abundance and at less cost, it would be more extensively used than it is now. This result is now accomplished—not in the manufacture of parchment from the skins of animals—always limited in number—but from vegetable substances, which are abundant everywhere.

On page 297, volume XII, SCIENTIFIC AMERICAN, we related the discovery of W. E. Gaine, for making this material, and briefly described the method by which the result was accomplished. Hitherto, we have never had the pleasure of examining any specimen of the product, but we have at last been gratified in doing so by Mr. P. Supple, of No. 119 Nassau-street, this city, who is an agent for the London manufacturers of it. By mere inspection it cannot be distinguished from animal parchment; it is nearly as strong, is quite as flexible and apparently as durable.

As a new article of manufacture, it forms another era in the advancement of the arts; and to men of science it is very interesting as a new chemical phenomenon. It is made by submitting unsized paper for a few seconds to the action of sulphuric acid, diluted with one half its bulk of water. This operation is a very delicate one to execute, because, if the exact degree of acid dilution is not secured, the desired result is not effected; a very little too much water, or a few seconds rather long exposure to the acid, will completely alter the product. This acid action, although it completely changes the nature of the paper, and converts it into quite a different material, strange to relate, does not alter its composition—it remains identically the same as woody fiber. The extraordinary transformation which the paper undergoes depends solely upon a molecular re-arrangement of its constituents, not a new chemical combination. Woody fiber exposed for a considerable period of time to the action of dilute sulphuric acid becomes *dextrine*—a totally different substance, but still identical in composition; and this vegetable parchment appears to be a connecting link between *celluose* and *dextrine*. Professors A. W. Hoffman, F. R. S., and Alfred Smee, F. R. S.,—both eminent chemists in London—have examined and analyzed it, and their reports are very favorable regarding its qualities. It appears to be eminently adapted for writing, drawing and bookbinding, and for many other purposes for which both paper and vellum are now used.

Tribute of Respect to the New Postmaster-General.

At a meeting of the employes of the United States Patent Office held on Saturday, the 12th inst., preparatory to calling upon the Hon. Joseph Holt, and formally taking leave of him upon his vacation of the office of Commissioner of Patents, Samuel T. Shugert was called to the chair, and De Witt C. Lawrence appointed secretary. Resolutions complimentary to Mr. Holt were passed unanimously, and on motion of Dr. Antisell, Henry Baldwin Esq., Senior Examiner in the Office, was deputed to address the Commissioner in their behalf, which he did in a chaste and sensible speech. Mr. Holt replied in the following strains of touching eloquence:

"The words which you have been so good as to address me with, on behalf of yourself and those around you, I have heard with mingled emotions of sorrow and gratitude; of sorrow because they announce the termination of the intimate official intercourse which has existed between us, the kindly tone of which has always brought to me unalloyed gratification; emotion of gratitude, because I welcome these words as the expression of that friendship and confidence on your part which I have so earnestly desired to gain, and the recollection of which I shall ever cherish with pleasure and with pride. Some eighteen months ago, in this room, I met, for the first time, the official body of the United States Patent Office. We met as utter strangers to each other. Since then we have counseled and toiled and endured together, and it is to me a source of the most intense satisfaction to be able to believe that, though we then met as strangers, we shall now separate as friends. On that occasion, sirs, I entered this building with trembling apprehension, persuaded, as I was, of my utter want of preparation for the arduous and perplexing responsibilities which lay before me. And if, from that hour until this, any success has marked the administration—and I say it with frankness, because it is a tribute justly due to yourselves—if any success has marked the administration of this Office, it is due, and due only, to the zeal, the fidelity, and the ability of those associated with me in the service, from whom I have ever received the most cordial support. Whatever of good or evil fortune may hereafter betide me, be assured, gentlemen, that the period of our official connection here, however much of labor and of anxiety may have belonged to it, will be ever present to me as a garden of precious memories, whose perfume the years cannot waste. To the high personal enjoyment which I have in the retrospect of our relations, there is added at this time a loftier one, growing out of that conviction which seems to prevail alike within and without, that the Patent Office was never in a more prosperous condition than at this moment. The inventive genius of this great and free people, tameless and dazzling in its play as the lightning that flashes from the storm-cloud, was never more active, never more triumphant. The brilliant memorials of its success which are pouring in upon you every day attest this, and are in themselves jewels fitting for the adornment of this magnificent national monument, which has been reared solely for their reception. In leaving, gentlemen, this truly elevated and intellectual field of labor, this shrine where the restless mind of the nation brings the noblest and grandest of its offerings to the cause of human progress, I beg to tender you my heartfelt thanks for that courtesy, kindness, and co-operation which you have ever extended to me, and to add my most fervent wishes for your prosperity and happiness in all the paths and relations of life, and especially for the continuence of each of you in that happiness which I rejoice to believe you all now possess, and which is above the reach of every spoiler—a happiness complete and abounding, which flows, and can only flow, from a sense of duty performed."

By the same mail which brought to us the proceedings of respect presented above, we also received the subjoined very gratifying testimonial from Mr. Holt:—

WASHINGTON, March 17, 1859.

GENTLEMEN:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obed. servt.,

J. HOLT.

To Messrs. MUNN & Co.,
Solicitors of Patents, New York.

Verifying Coal Weight by Cubic Measure.

Philadelphia papers give the following rule to verify the weight of Pennsylvania coal:

"Coal put into bins and leveled, can be measured from one to a thousand tuns with as much accuracy as it can be weighed on scales. For instance, Lehigh white-ash coal, per tun of 2,000 lbs. of the egg or stove size, will uniformly measure 34½ feet cubical, while white ash Schuylkill coal will measure 35, and the pink grey and red-ash will reach 36 cubical feet per tun of 2,000 lbs., or 40 feet for 2,240 lbs., the difference of cubical contents between the net and gross tun being exactly four feet. If the length, breadth, and hight of the bin be multiplied together, and the product is divided by the aforenamed contents of a tun, the quotient must show the number of tuns therein."

A glass tube may be drawn out as fine as silk without losing the tubular form.

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The Coal Oil Controversy.

MESSRS. EDITORS.—In your paper of Feb. 12th. you say that Young's patent "seems to cover the manufacture of all coal oils, both in essence and principle, and unless some person can be proven to have made the discovery prior to Young he will be sustained in his position." It is a very easy matter to show that coal oil and its constituent parts were well known long before the date of Young's patent, and this being a matter of great interest to many of your readers, perhaps you will allow me to briefly state some facts in relation to it in your columns.

I am not able at present, to give the exact time when coal oil was discovered, but can probably do so by consulting "Berzelius' Yahresbericht der Chemie." But by reference to the London *Chemist* for November, 1858, page 97, you will find a quotation from "Poggendorff's Annalen der Chemie," Vol. XXXI, page 70, describing roseoleic acid as a chemical decomposition of coal oil. This was written in the year 1834. By reference to the "Yahresbericht der Chemie" of Liebig and Kopp, for 1847 and-8, page 654, it will be seen that Andersen in 1846 had obtained from coal tar besides Anilin, Leukol, and Pyrrol, another base isomeric with the first mentioned and which he named Picolin. By reference to "Kolbe der Organishe Chemie," page 396, it will be found that carbolic acid was first recognized as an acid by Runge in 1834, and that it was first obtained pure by Leaurent in 1840. By reference to the same work, page 517, it will be seen that Naphthalin, one of the solid products of coal, was first discovered by Gardner, in 1820, in coal tar. By reference to "Kane's Chemistry," republished in this country in 1842, page 641 it will be seen that Paraffine is described in it, and said to be derived from beechwood tar, and from coal. Its production from coal must have been at some time previous, but probably the exact date can be found in the work of Berzelius above referred to, as that comes up to 1849 at which point the "Yahresbericht" of Liebig and Kopp commences.

By reference to the latter work for 1847-8, page 711, it will be seen that Mansfield had before that time discovered Benzole, Toluol, Cumol and Cymol in the oil from coal, and had given their constitution and boiling points. These substances had been known before, but had been derived from other sources, and were first recognized by him as products of the destructive distillation of coal. These are the principal constituents of coal oil, both burning and lubricating, and some of them have to be removed from it on account of their offensive odor. There are some other substances found in minute quantity in the crude oil, such as xylol, crediret, &c., which want of space prevents me enumerating.

Now, it strikes me as most sublime impudence for a man to claim the discovery of coal oil in essence and principle, when it had been produced long before, and every important constituent in it had been thoroughly investigated and published to the world. From the authorities quoted, it will be seen that it was known in 1834, and probably long before, as naphthalin was discovered in 1820. Another fact to be noted is, that these substances had all been produced by the destructive distillation of coal in iron retorts, in essentially the same manner as coal oil is now produced. The process of distilling coal for oil is the same in principle as its distillation for gas; the same retorts are used, and the nature of the products is determined by the degree of heat applied to the retort. It is practically impossible to distil coal for gas, without the simultaneous production of oil and tar, and *vice versa* coal cannot be distilled for oil without the simultaneous production of tar and gas. But on this subject it is unnecessary to enlarge at present. If Young's patent is worth anything I am much mistaken. JAMES CAMPBELL.

Dayton, Ohio, March 12, 1859.

[The SCIENTIFIC AMERICAN has been the steady defender of the rights of the inventor at all times, and in discussing the coal-oil question it has only held to its old and oft-repeated doctrines. Our correspondent, in a private letter to us, intimated that some coal-oil men think we are interested because of the bold stand taken by us in reference to Young's patent, we repeat the assertion that we have not a particle of interest in the matter, and have never so far as we know had a word of communication directly or indirectly with Mr. Young or the parties who may be interested with him. We know nothing about them whatever, and what is more, we want nothing of them. Here is the great advantage of our position over those who are interested in this patent, and we doubt not that our correspondent, under circumstances like those which surround Mr. Young, would be gratified beyond measure to have an influential journal volunteer a defense of his rights.

Our correspondent has presented a respectable array of testimony in support of the view which he takes of this question, but the information which we published on page 118, on tar-oils as manufactured by Mansfield's process, is much stronger testimony than any to be found in the authorities to which we are referred. It is our opinion, however, that none of these are really applicable to this case. The simple question is: was not Young's patent the first public document which revealed the fact, that oils for illumition and lubrication could be manufactured as a useful product from coals submitted to regular, not destructive distillation?" We have never read in any work that coals had ever before been regularly distilled for such a purpose, and must consider Young the discoverer of this manufacture until we have proof to the contrary. The question is not, that mineral oil, or oil derived from the waste products of destructive distillation of coal, was known before, as such coals were not distilled for such products at all, but whether coals had ever been distilled regularly for their oil. By the regular distillation of the coal a large amount of oil is secured, which by destructive distillation would pass off as gas and unreclaimable tar. This is a new economical result or discovery in obtaining coal-oil, and it has not been shown that any person discovered this prior to Mr. Young. In the absence of any proof to the contrary, we believe his patent has failed for the want of compliance with the law requiring its introduction as stated in our last. Mr. Young preserves a profound silence in reference to a discussion of his claim.

Bagasse Fuel.

On page 204 of the present volume of SCIENTIFIC AMERICAN we published the substance of a letter from a correspondent in St. James, La., regarding the burning of bagasse as fuel. In answer to this, Gideon Bantz, Esq., of Frederick, Md., states that his furnace, illustrated in No. 2 of the present volume, SCIENTIFIC AMERICAN, will do the very thing which our correspondent stated was so much wanted by the sugar-planters. Mr. Bantz says he will go down and put it up for the planters, and guarantee it to give satisfaction, or no remuneration. This is a fair offer, and those planters who are desirous of obtaining such an improvement can communicate with him on the subject.

Several parties have written us upon the subject referred to by our St. James correspondent, but no one of them has offered any such inducement as here put forth:

MESSRS. EDITORS:—I see in your last number of SCIENTIFIC AMERICAN, a correspondent from St. James Parish, Louisana, in regard to a furnace for burning bagasse to raise steam to operate the rolling-mill, as well as to evaporate the juice, by using the heat made by bagasse, under the kettles, or in other words, an encouragement to use bagasse instead of wood, as fuel. Well, sirs, be kind enough to give me his name, so that I can correspond with him on the subject. I have the furnace arrangement to do it to perfection; I will go down and put one up, and operate it for them, guarantee it to give proper satisfaction, or no remuneration do I require of them. Mine continue to give universal satisfaction. One of the largest tanners in your State sent a machinist into my yard, this month, to see if mine was operating as he was informed; he remained with us several hours, was delighted with its operations, and ordered a model and drawings, which I have forwarded to him. I hear he has an idea of purchasing New York State. Well, gentlemen, it is a fact we burn water, and depend on it alone for our draft! The chemical description of Professor Hare's compound blow-pipe in its combustion of hydrogen gas, comes nearer to it than anything I have ever seen, although the mechanical arrangement is quite different. Please give me the gentleman's address, and oblige yours truly.

GIDEON BANTZ.

Frederick, Md., February, 1859.

Variable Brightness of the Stars.

We ascertain that the sun revolves around an axis by noticing the spots on its surface. When there are many spots toward us, the light of the sun must be enfeebled, sometimes even sensibly so. There are variable stars that periodically become dim, and then again assume their former brightness. The natural solution of this fact is that these stars are like the sun, not merely in their light, but also in the way that light is produced. Perhaps there are spots upon their surface, which, when turned toward us, cause their light to become dim. There are stars also which may be called *temporary*, for after appearing in the heavens for a brief period, they seemingly become very small, or they disappear altogether, a fact which can hardly be accounted for, except by the supposition that there has been a real physical change in the body itself. In undergoing these changes, there have been manifest changes of their color, and these have been so great as to lead to the conclusion that there has been a combustion of the body in question. The star seen by Anshelm, in 1670, was of the third magnitude; it passed through great fluctuations of light for two years, and then became invisible. There are, moreover, lost stars, whose places are now vacant, though some of them have been recently observed. When we look at these strange fluctuations, we may suppose that something like combustion has taken place, or that the power of giving light by these stars has been suspended. In reviewing these facts, it appears difficult not to conclude that here was a world whose destiny was, for the time being, completed, and the fitful glare of whose funeral pile shooting across the vast distance which separates us, came with undiminished velocity to tell us the tale that it *once was.—Professor Alexander.*

Growth of London.

By the report of the Registrar-General for 1858, we learn that London has a population of 2,876,000, and it is now the largest by far in the whole world. In 1801, its population was was only 958,000 so that its increase has been very rapid for an old European city, It affords evidence of the robust health of Uncle John, and the tendency which he has to spread himself, equally with his smart descendant, Brother Jonathan. The city of London covers a space of 121 square miles, and it has more houses to its inhabitants than New York as a consequence it is more healthy, and life is of longer duration. In olden times, all the cities were crowded into much less space than those of our day, and they were generally surrounded with high walls; the average duration of life was then much shorter than it now is. A great increase of building space in cities has walked hand in hand with modern civilization.

Notes and Queries

*** PERSONS who write to us, expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

WE are unable to supply several numbers of this volume; therefore, when our subscribers order missing numbers and do not receive them promptly, they may reasonably conclude that we cannot supply them.

J. H. G., of N. H.—Instruments have been invented to be applied to carriages for the purpose of registering the distance which they travel. They are called odometers.

F. J., of C. W.—We do not think it possible to obtain a spring of sufficient strength to propel a pleasure boat. You had better employ horse-power or a small steam-engine.

G. H. G., of Mass.—By referring to the back numbers of the SCI. AM., you will find engravings and descriptions of several horse-power corn-planters.

L. C. M., of Iowa.—The amount of pressure which a steam boiler is able to sustain depends more on the soundness of the iron all through than on its thickness, and in a great measure on the shape and size of the boiler. Plain cylinders will bear the highest pressure. The rule for calculating a safety-valve is as follows:—Divide the distance of the ball from the fulcrum of the lever by the distance of the valve-stem from the fulcrum both expressed in inches, multiply with the weight of the ball in pounds, add the weight of the lever and of the valve, and divide by the area of the valve in square inches. The result is the number of pounds on the square inch which the ball will sustain. Your safety-valve with the ball at the end of the lever will blow off at 85 5-7lbs. of pressure.

J. McP., of A.—The manipulations of the processes of amalgamation to catch "float gold" would take up too much space for us to describe. We can, however, refer you to a little work on gold-mining, published by G. Routledge & Co., this city, which will give you the desired information.

G. G. Van W., of Wis.—You or some other person must first discover a bright and cheap red paint before you dispense with vermilion; we know of none. The sulphate of zinc is the best drier which we can recommend. It appears to us that sieves made of perforated sheet iron or tin would answer your purpose as well as the metal you describe.

G. C. H., of Ohio.—To bite old files with an acid, first cleanse thoroughly so as to remove all grease, then make up a solution of one part of sulphuric acid to six of warm water, and put them in this for an hour in an upright position. After this, wash them in hot water containing a little alkali, such as soda, when they will be found fit for use.

J. H., of Mich.—Send us a description of your method of fixing chalk drawings. Your letter does not shed that light upon the subject which you claim to possess.

T. McG., Jr., of Ohio.—Under a four-foot head of water the velocity of discharge in a sluice is 10 4-100 feet per second. The actual co-efficient of discharge is 5 2-100; the theoretic co-efficient is 8.2. The examples to which you refer, in Vol. XI., SCI. AM., and the rules are all in plain arithmetic. You have not given them sufficient attention.

A. B. M., of Me.—The best liquor you can use for tempering axes is water. To render the temper somewhat softer, use oil.

R. F. D., of Mass.—We think it is possible to make an indelible pencil. To prepare steel plates with photographic pictures for engraving is not patentable, because it is not new.

S. & W., of Ind.—Canvas hose, although air-tight, will not answer for a siphon as a suction-pipe, because it will collapse. This has been our experience.

J. & G., of Mass.—All the information we possess regarding the zincing of iron you will find described on pages 269 and 277, Vol. XII., SCI. AM.

H. H., of Pa.—Crosby, Nichols & Co., of Boston, are the publishers of Silloway's Text-Book of Modern Carpentry—a good work, and of such a character as will be useful to you.

W. C. A., of Iowa.—All coal is mineral, but it is of vegetable origin.

J. T. S., of Wis.—You can stain bone or ivory red with carmine. Gold cannot be stained, but you can make a red varnish and paint it.

H. A. M., of Mo.—The ore you sent us was iron pyrites. It is of no value.

J. H. P., of N. Y.—There is no heat lost by the expansion of steam in a cylinder except by condensation. The invisible products of combustion are not so hot as flame. The latter is the reflection of solid particles of carbon raised to a white heat.

F. B. L., of Mo.—We do not quite comprehend your proposed method of flying. So far as we understand it, the means proposed is wings propelled by muscular exertion. You never can fly by this means upon any known principle.

E. G. S., of Cal.—To dry the wet steam of your boiler, you should lead the steam-pipe through the smoke-box and a perforated plate. Messrs. Wethered, of Baltimore, Md., are the patentees of the combined steam and stame for engines. India-rubber belting does not appear to wear more with frequent shiftings off and on the pulley than a leather belt. We cannot give you an opinion as to the durability of such belts.

D. M., of Ill.,—A wheel has just as much leverage at the top as the bottom, because the radii are of equal length. One of four feet diameter moves through a space of 12.56 feet during one revolution; according as you have stated the question, it would move through a

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space of 36 feet. Even if the leverage of a wheel decreased towards the bottom, it would only prove that the top was not the place for the brake, but some place near the bottom. Your instrument for measuring trees and logs appears to be useful and patentable.

J. L. B., of Md.—The best substance which you can use to fasten letters of lead to patterns of cast-iron to prevent them from coming off in molding is plaster of Paris. It is an excellent non-conductor, and as we understand you, this is what is desired.

F. A. C., of N. Y.—You can easily remove the scale from copperplates by scouring them with water and sandstone, or by placing them in a strong acidulous liquor, such as sulphuric acid and water, or muriatic acid and water.

D. B. C., of Pa.—Emery-cake consists of fine emery mixed with suet and beeswax, which are melted in a vessel, and the emery stirred in. When thoroughly incorporated, the mixture is poured among cold water, then kneaded with the hand into lumps before it is thoroughly cooled.

G. C. T., of Pa.—Tar roofing requires much care to put it on properly. It should be laid on in a dry period upon thick paper, and the materials should be boiled for at least five hours before they are applied. Asphalt boiled with sand, bitumen and gravel makes a cheap and good roof. We are not acquainted with Warren's roofing material. Neither iron nor zinc is employed in any of the common roofing cements, so far as we now.

E. F. B., of N. Y.—Your article is very long, and it would require about as much space (if we published it) to answer the mooted points. The difficulties presented can all be explained, we believe, so as to convince you that there is no identity of nature between iron, hydrogen, and electricity.

W. H. M., of Mass.—We are not familiar wiih the process of painting on glass by the names you give, but we presume that silica colors are used mixed with a transparent varnish, the broad tints being stipled in, instead of being washed.

E. J. H., of Me.—Gum mastic dissolved in alcohol of 92 per cent proof, or in turpentine, makes a pale clear varnish for polished metal work.

H. J. B., of Pa.—The polishing of silver-plated articles requires considerable practice; it is wholly a work simply demanding skill of hand. Use a bright burnisher, and a little water to keep it moist while operating, and you will soon master the art.

J. H., of N. Y.—The relation of the circumference of a circle to its diameter is as 3.14159 to 1. This is near enough for all common purposes, but the circle has never yet been squared, and in our opinion never will. Why waste time upon such unprofitable schemes?

I. H. N., of Vt.—The gutta-percha coating of the cable to which you refer, we are of opinion, was cracked in the handling. We have made such experiments as have convinced us that this was the case.

J. W. S., of D. C.—Fiue steel is the best substance for making permanent magnets. They will retain their magnetic power for centuries, if properly kept.

A. R., of N.Y.—If you use some sal-ammoniac in your steam boiler, we believe it will remove all the scale. Put in about two pounds for the first trial. You should endeavor to get a sufficient supply of soft water, as you will always have trouble with such hard water as that in your neighborhood.

E. V. L., of Ten.—Different tools require different quantities of steel, and modes of treatment in tempering. As a general rule, never heat above a cherry red color; and if liable to crack by plunging into cold water, plunge it first into warm oil, then into cold water. There is a great variety of compositions used for tempering, but some tool-makers use nothing but cold water.

L. B. K., of Pa.—Wall-paper intended to be varnished on the surface, after it is put on, should be moistened with sizing before it is placed on the wall, so as to allow some of it to strike through and protet the colors, after it dries. The varnish may then be applied, or a coating of thin white glue size may be given previously. great care is necessary to perform these operations, as the colors are liable to run into one another.

O. H., of Cal.—A patent could not be obtained for carpeting horse-stall with heavy rubber.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, March 19, 1859:—

W. W., of Mich., $30; C. & S., of Ct., $30; D. R., of Pa., $30; L. B. T., of Mass., $30; W. H. K., of Ill., $30; W. & D., of Pa., $25; P. & B., of Ct., $25; T. J. P., of O., $35; B. H. W., of Mo., $55; A. C. L., of Pa., $25; S. F. A., of Ky., $30; J. S. P., of R. I., $30; P. A., of N. J., $30; H. T. D., of O., $10; I. K., of Ill., $30; K. & P., of Ct., $30; T. N., of Mass., $25; C G. C., of Wis., $30; N. J. K., of Ill., $10; A. P. T., of Pa., $25; L. H. M., of Pa., $25; H. M., of Ky., $25; D. L., of Mo., $25; J. S. W., of Iowa; $25; S, B., of N. Y., $30; J. C. S., Mass., $55; H. & Co., N.Y., $62; R. G., of , $35; N. J. H., of N. Y., $30; P. McK., of S. C., $100; S. R. H., of N. Y., $25; J. B. A., of N. H., $300; O. B., of O., $30; F. B. B., of N. Y., $55; H. & M., of Ct., $30; J. W. N., of Ohio, $30; C. W., of Mass., $30; A. Y., of N. Y., $55; M. R., of Cal., $35; J. B., of N. Y., $35; J. C. D., of Ky., $25; G. W. B., of Ct., $55; H. M., of N. Y., $25; L. S, of Ala., $30; J. A., of N. J., $10; G. & T., N. Y., $30; H. A. G., of Ind., $25; H. S., of R. I., $25: R. L. B., of Mich., $25; G. T., of Ind., $30; G. D. G., N. Y., $30.

Specifications and drawings belonging to parties with the following initials have been forwardod to the Patent Office during the week ending Saturday, March 19, 1859:—

W. H. G. of N. H.; W. G. R. of Mass.; T. N. of Mass.; H. M. of N. Y.; M. R., of Cal.; A. P. T. of Pa.; P. A. of N. J.; P. & B. of Conn.; D. F. of Pa.; E. I. of Conn.; S. R. H. of N. Y.; W. & D. of Pa.; D. L. of Mo.; J. S. W. of Iowa.; R. L. B. of Mich.; A. C. L. of Pa.; J. S. of N. Y.; G. W. B. of Conn.; S. B. D. of N. Y.; H. A. G. of Ind.; H. M. of Ky.; L. H. M. of Pa.; H. S. of R. I.; G. U. B. of N. Y. J. C. S. of Mass.; J. B. of N. Y.; S. D. T. of N. Y.

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Science and Art.

New Telegraph Cable.

Some of our foreign cotemporaries state that our countryman, Mr. Hughes, who is now in England, has invented a new cable which is to remedy all the difficulties occuring from breaks in the gutta-percha coating. The invention is described as consisting of enclosing the conducting wire in a coat of some semi-soft substance, such as tar or tallow and bee'swax, then forming an outside tube of gutta-percha. The idea embraced in such an arrangement is to fill up cracks by the soft material in the gutta-percha in case the latter should crack with the strain. This invention appears to be worse than useless, for if the gutta-percha tube should crack, the soft enclosed substance will be forced through it, and leave an unequal space between the outer coat and the conductor, thus tending to injure the uniform conducting capacity of the inner wire.

Mr. J. N. Hearder of Plymouth, a celebrated English electrician, has also invented a new submarine cable, the object of which is to lessen the inductive charge, which always results from an outer sheath of metal, like that of the quiescent Atlantic cable. He firsts covers the interior wire with cotton, silk, or wool, or flax in one or more layers, and on the top of this, he places the coat of gutta-percha, and has no outer wire sheath. This will make a very good cable for effecting the object stated, but there is nothing new in the cable itself. It is exactly the same as if we took common silk covered wire and coated it with gutta-percha.

The principle of Mr. J. Allan, of London, for constructing a telegraph cable, is, to make the interior wire of sufficient strength to withstand all the strain, and coat it with gutta-percha in layers, using no outside metallic sheath. There is some sense and principle in this invention, because the larger the conductor, the less will be the resistance, in proportion to the square of its diameter. The Atlantic Telegraph Company expects to get a subsidy from the British Government, and a promise has been obtained to this effect, if they lay another cable. It is believed that they will do this in the course of a year or two more at the furthest. This is the right *clear grit* spirit which we like to see exhibited, while success is possible; and who dare say, "it is not"?

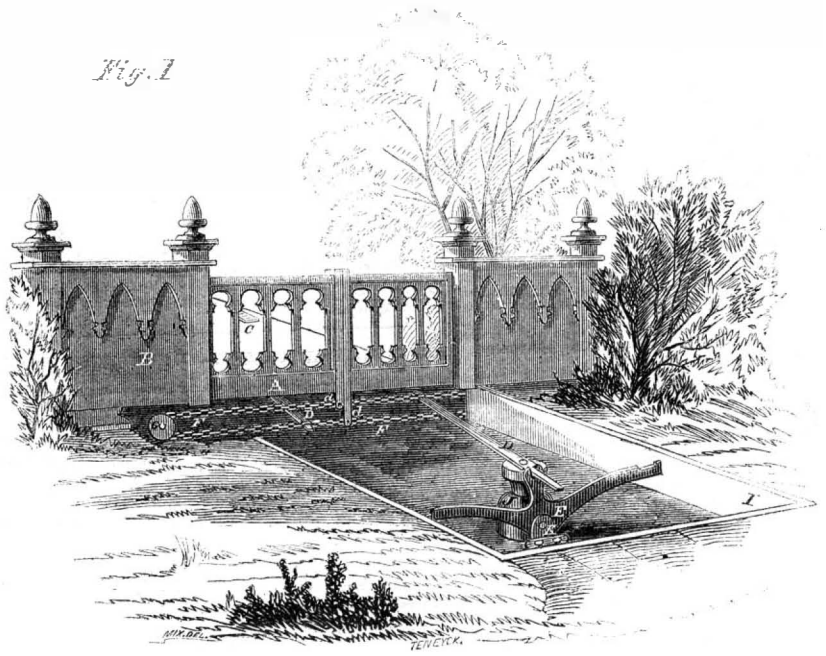
New Automatic Gate.

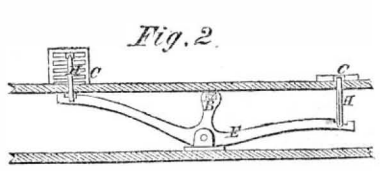
We are at a loss to imagine why people generally do not see the practical value of many inventions and use them as extensively as occasion affords. For example, we can see in our rambles many places where an automatic gate would be a decided improvement; but for some reason or another, the proprietor of the place does not put one up. Every now and then we jog the public mind, and call the people's attention to the fact that there are such things, and we are about to do so again by describing the invention, of Ezra C. Rowland, of Phelps, N. Y.

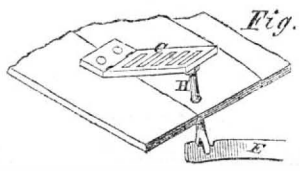
Our illustrations shows this simple and excellent contrivance; figure 1, being a perspective view, with the flooring or road-way removed to exhibit the operating parts; figure 2, showing the lever that operates the chain; and figure 3, is a view of the operating step or lever.

A A, represent the gates constructed as ordinary sliding gates are made, and B B, the casing around them. I I I, is the frame-work or box which contains the apparatus operating the gates, and which may be constructed of plank or other material from 6 to 10 inches high; it is to be covered with plank and so placed in the ground that the top of the plank covering is even with the surface of the ground. C C, are levers upon hinges which the carriage wheel acts upon to open and shut the gates, and H H, are rods which connect the levers, C C, with the levers, E E; the rods are attached to the levers, C C, by a joint, and the other end is connected by a slot resting upon the end of levers, E E. The levers E E, can be constructed of wood or metal. They move upon the pivot, K, by means of the rods, H H, and the levers, C C, which act upon the levers, D D, that pass through a slot in the top of levers, E E. Levers, D D, can be made of wood or metal of sufficient length to connect the levers, E E, with the chain, F F, and levers, D D, being fastened by a pivot at J, and the opposite end fastened to the chain, F F, one lever to the lower, and the other to the upper chain as seen in Figure 1. The chain, F F, is endless and passes

ROWLAND'S AUTOMATIC GATE.



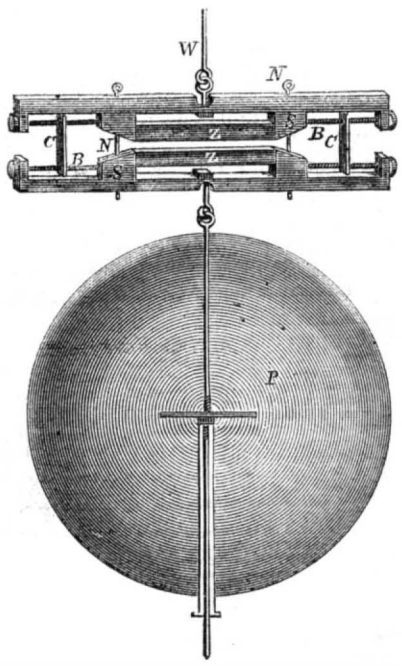




around two friction pulleys, G G, and it is attached to the gates by means of the two rods, *d d*, which rods move through a slot in the planks under the gates. When the carriage approaches the gates, the wheel passes upon the lever, C, at the right, which operates upon the rod, H, pressing down the lever, E, that moves the lever, D, and so moves the chain, F F, thus opening the gates; and as the carriage passes through the gates, the wheels at the right pass upon another of the levers, C, that by its connection with the lever, D, and the chain, causes the gates to come together or shut.

The patent is dated October 19th, 1858, and the inventor will be happy to give any further information upon being addressed as above.

Improved Compensating Pendulum.



A clock, to beat true seconds, must have a pendulum of certain and unvarying length, and as the metal of which it is composed expands and contracts with the temperature of the atmosphere, some device called a compensator has to be used to keep the pendulum the same length at all temperatures. The subject of our illustration is an excellent device for this purpose, one that is truly ingenious and scientific in principle and action, and on the reliability of which every dependence can be placed.

P is the pendulum-weight suspended from the compensator which consists of two wrought-steel frames, S, provided with adjusting screws, B, and suspenders, C, that can, should the pendulum-weight be heavy, be carried over the frame, so as to take the strain off the screws. N are steadying pins passed through both frames. In each frame is placed a small bar of zinc, Z, and this is the principal feature of the invention. Suppose, when first hung in a clock, the weather to be temperate and the steel bars to be straight; when the temperature rises, the zinc expanding three times as much as the steel, the bars will not be straight but the ends of the upper bar will be raised above the level of its center, and the ends of the lower bar will be depressed below the level of its center; the ends of the steel bars or nearly the ends, being confined by the suspenders, C, cannot separate, consequently the centers of the two bars must aptproach each other, and the same change of temperature which bring the centers nearer ogether will also elongate the rod *vice versa* when the temperature is falling.

The nearer the center of the apparatus the suspenders, C C, are placed, the less the compensation, and the further from the center, the greater; hence by revolving the screws either way, as the case may require, a perfect adjustment can be effected. The size of the device can be regulated to the clock, and the usual pendulum wire, W, can be employed.

W. L. Coffinberry, of Grand Rapids, Mich., is the inventor, and he will be happy to give more information to all who feel interested in the invention. The patent is dated Dec. 28, 1858.

American Horse Shoe Machine.

One of the machines of Mr. Henry Burden, of Troy, N. Y., has been fitted up by him at Wolverhampton, England. The London *Engineer* contains a flattering notice of it. "The shoes made by it," says our cotemporary, "are remarkable for their exactness in shape and in the position of the holes—a most important point with regard to the safety of horses' feet; and they can be produced at the rate of sixty per minute, which is more than two men can forge in a day, and the superiority over shoes forged by hand is very striking. It has been fitted up at Wolverhampton as a central and suitable place of inspection, both for England and for any person on the continent who may desire to purchase."

New Matches.—Common friction matches contain phosphorus which is poisonous, and no substitute has heretofore been discovered to supply its place. It is stated in *Comptes Rendus* that M. Canouil, chemist, Paris, has succeeded in making friction matches without the use of phosphorus. They are formed essentially of the chlorate of potash mixed with a small quantity of a metallic peroxyd or the bi-chromate of potash.

Concrete Building in France.—Very extensive experiments are now being made in France, to test the durability of concrete blocks in sea water. If it is found that they can resist its action, a fort is to be built of such blocks at St. Jean de Luz, the cost of which will only be 6,000,000, instead of 30,000,000 francs by the use of solid rock.

New Scarlet Dye.—It has been said that those nocturnal tormentors which infest bedding in many localities, have but one use, "to teach mankind humility." A chemist at Melbourne, Australia, however, has discovered that they may be as usefully employed as the cochineal insect itself in producing a scarlet dye, specimens of which have recently been exhibited.

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